MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE.

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INTRODUCTION.

The present summary for 1901 is based essentially upon data received from about 162 regular stations, 33 regular Canadian stations, and such voluntary stations as have forwarded their annual summaries in time. The statistical tables and charts have been prepared under the supervision of Prof. A. J. Henry, Chief of the Division of Meteorological Records; the tables of movements of high and low areas by Mr. George E. Hunt, Chief Clerk, Forecast Division; and the summary of flood movements by Dr. H. C. Frankenfield, Forecast Official.

FORECAST DIVISION.

Prof. E. B. GARRIOTT, in charge.

HIGHS AND LOWS OF 1901.

The high and low data for the year 1901 have been compiled under the general plan in use since 1895, and they differed but slightly in their general features from those of the preceding six years.

The tables herewith give the summary for each month of the year 1901, and likewise a summary for the seven years from 1895 to 1901, inclusive.

Summary of highs and lows for 1901.

Month.	Highs.							Lows.						
	Mean first observed.		Mean last observed.		Path, average.		Hourly velocity.	Mean first observed.		Mean last observed.		Path, average.		Hourly velocity.
	Lat. N.	Long. W.	Lat. N.	Long. W.	Length.	Duration, days.		Lat. N.	Long. W.	Lat. N	Long. W.	Length.	Duration, days.	
	°	°	°	°	*Miles.*			°	°	°	°	*Miles.*		
Jan.....	44	108	40	76	1,918	2.4	33.5	43	110	45	70	2,789	4.0	33.1
Febr....	46	108	39	79	1,173	2.5	28.8	41	111	40	78	2,222	3.2	31.7
Mar.....	39	101	38	72	1,989	3.1	26.6	40	105	40	73	2,343	4.4	26.4
Apr.....	42	116	41	85	1,933	2.8	28.7	41	109	43	85	1,972	3.1	26.7
May	53	112	41	81	2,362	4.4	22.0	43	95	44	70	1,658	3.0	23.1
June ...	50	111	41	70	2,425	4.1	25.5	41	100	44	79	1,532	2.8	24.1
July....	49	106	38	74	2,276	3.8	25.1	39	95	41	74	2,043	3.8	22.1
Aug. ...	51	108	46	66	2,425	4.1	25.1	38	102	46	74	2,133	4.1	28.2
Sept. ...	52	119	42	66	3,160	4.5	29.0	38	104	46	70	2,622	4.4	25.9
Oct.....	50	112	41	74	2,384	3.6	29.7	45	108	48	73	2,036	3.1	28.4
Nov	48	107	39	80	1,866	3.0	25.7	47	116	43	64	2,461	3.7	28.6
Dec.....	46	114	42	77	2,846	4.2	31.1	43	108	46	74	2,464	3.1	36.2
Means..	48	112	41	75	2,229	3.5	27.6	42	105	44	74	2,190	3.6	27.8

Summary, 1895 *to* 1901, *inclusive.*

Year.	Highs.					Lows.				
	Mean first observed.		Mean last observed.		Hourly velocity.	Mean first observed.		Mean last observed.		Hourly velocity.
	Lat. N.	Long. W.	Lat. N.	Long. W.		Lat. N.	Long. W.	Lat. N.	Long. W.	
	°	°	°	°	*Miles*	°	°	°	°	*Miles*
1895.....	47	110	39	80	24	45	107	45	73	26
1896.....	48	111	42	75	24	46	111	46	74	26
1897.....	48	113	38	78	24	46	110	46	71	26
1898.....	46	114	40	72	25	45	111	46	67	26
1899.....	47	114	41	72	24	44	111	46	68	27
1900.....	46	108	42	75	28	44	106	45	73	30
1901.....	48	112	41	75	28	42	105	44	74	28
Mean...	47	112	40	75	25	44	109	45	71	27

Geo. E. Hunt, Chief Clerk Forecast Division.

RIVER AND FLOOD SERVICE.

During the year Macon, Ga., was established as a river center for the territory comprising the Oconee and Ocmulgee watersheds, which were formerly a part of the Atlanta district; the Washington, D. C., district was enlarged by the addition of the territory east of the Allegheny Mountains which formerly belonged to the Parkersburg, W. Va., district. There were added to the River and Flood Service 11 special river stations, and one special rainfall and three special river stations were discontinued. The stations established were at Booth, Tex., Galveston district; Clarion and Saltsburg, Pa.,

Pittsburg district; Cumberland, Md., and Riverton, Va., Washington district; Frankfort and Highbridge, Ky., Louisville district; Camden on Gauley, W. Va., Williamson, W. Va., and Warfield, Ky., Cincinnati district; and New Madrid, Mo., Memphis district. Those closed were the special river stations at Arlington, Mo., St. Louis district; Philippi, W. Va., Pittsburg district; Lock No. 4 (Lincoln), Ala., Montgomery district; and the special rainfall station at Cumberland, Md., Washington district.

Thirteen new river gages were installed and a large number of others thoroughly repaired.

The service has not only maintained its previous high reputation for efficiency, but has still further added to it. As an evidence of this it is only necessary to refer to the steady increase in the number of requests for the benefits of the River and Flood Service.

While there were no really great floods during the year, there were several of somewhat decided proportions, particularly those of the Ohio River in April, the upper Tennessee in May and the rivers of the Atlantic States in December. Accounts in detail of these and other floods will be found in the MONTHLY WEATHER REVIEW for the appropriate months.

The highest and lowest river stages for the year, together with the mean stage and annual range. at 134 selected stations are given in Table VIII.—*H. C. Frankenfield, Forecast Official.*

GENERAL CLIMATIC CONDITIONS.

By ALFRED J. HENRY, Professor of Meteorology.

ATMOSPHERIC PRESSURE.

The numerical values of annual mean pressures for 1901 are given in Tables I and II. The method of reduction to sea level in use during the year was the same as in former years, with the exception that an appropriate correction for variations in the force of gravity with latitude has been applied since January 1, 1899. In other respects the annual mean values are comparable with those of the preceding and other years in which Professor Hazen's method of reduction was used.

In addition to the table of reduced pressures, referred to in the preceding paragraph, a second table has been formed (Table III), in conformity with the custom of previous years, by reducing the actual pressures to sea level and standard gravity in accordance with the tables and methods of the International Meteorological Committee, as explained in the MONTHLY WEATHER REVIEW for 1895, Volume XXIII, pages 492–494. The reduced pressures so obtained appear in Table III and on Chart I. The data in the last column of Table III are the pressures at 10,000 feet above sea level, obtained by assuming a uniform decrement of temperature at the rate of 2° F. per 1,000 feet (0.37° C. per 100 meters), as in former annual summaries; the resulting isobars are shown on Chart II.

The distribution of mean pressure at sea level for 1901 is shown by the isobars on Chart I.

The configuration of the isobars for 1901 differs very slightly from that of 1900. Pressure was below normal over the eastern part of the country by amounts ranging from .02 to .05 inch; it was also below the normal in the Rocky Mountain region by amounts ranging from .01 to.08 inch. In the upper and middle Mississippi Valley and on the Pacific coast it was normal or slightly above.

TEMPERATURE.

The distribution of mean surface temperature is shown on Chart III, and the district departures by Table A.

Mean temperature was above the average in all parts of the country, except the South Atlantic and east Gulf States, the Ohio Valley, and Tennessee. The excess ranged from a fraction of a degree on the Pacific coast and in the Southwest to about 4° over the northeastern Rocky Mountain slope and Manitoba. Maximum temperatures of 110° and over were registered in southern Illinois, northern Arkansas, Missouri, southern Iowa, eastern Kansas, Oklahoma, eastern Montana, and South Dakota. Maximum temperatures of 110° were also registered in the Great Valley of California and in the desert region of northwestern Utah. The minimum temperatures of the year were not greatly different from those of the preceding year. Temperature fell to 40° below zero and lower in eastern Wyoming, southwestern South Dakota and northwestern Nebraska. The maximum, minimum, and mean surface temperatures are graphically shown on Chart III.

PRECIPITATION.

The distribution of annual precipitation is shown on Chart IV and the district departures by Table B. The year, as a whole, was marked by large local variations. It was unusually dry in the Ohio Valley, portions of the lower Lake region, and the Mississppi Valley south of Iowa. On the eastern Florida coast there was an excess of 18 inches at Jupiter and on the western coast a deficit of 10 inches at Tampa. The precipitation at Charleston, S. C., was 24 inches below the normal, and at Charlotte, N. C., 11 inches above the normal. There was an excess of rain in the upper Missouri Valley and also in the southern slope region. Rainfall was deficient on the Pacific coast and over practically all of the Plateau region.

THUNDERSTORMS.

The frequency of thunderstorm days in the different months and in the several States and Territories is shown approximately by the figures of Tables V and VI. The first-named table has been prepared from reports of both regular and voluntary observers with a view to showing the number of thunderstorm days recorded each month in the immediate neighborhood of the respective stations. The second table shows the number of days on which thunderstorms were recorded in the State or Territory as a whole. In preparing the last-named table reports from all stations whatsoever were used. The number of thunderstorm days for a given State, as shown in Table VI, depends largely upon the size of the State and the number and distribution of observing stations. In the District of Columbia, for example, with but one station, the number of thunderstorm days was 37, while for the adjacent State of Maryland, with an average of 58 stations, thunderstorms were observed on 123 days. In Virginia, with about 54 stations, the number of thunderstorm days was 130. The number of thunderstorms observed at a single station bears a fairly definite relation to the number that would be observed were it possible to greatly enlarge the field of observation. The ratio for Washington, D. C., is about 3.5, that is to say, in order to ascertain the number of thunderstorm days for a region equal in area to the adjoining States of Maryland and Virginia we have only to multiply the number observed at Washington by the constant 3.5.

Thunderstorms were reported on a greater number of days in 1901 than in 1900 in southern New England, the upper Ohio Valley, and the eastern portion of the Middle Atlantic States, also on the Pacific coast south of Washington, the southern Plateau and in the Southwest; elsewhere, the number reported during 1901 was considerably less than in the preceding year.

TABLE A.—*Average monthly and annual departures of temperature from the normal during* 1901.

Districts.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
New England	−0.3	−4.7	+1.1	+0.6	−1.5	+0.6	−1.9	+1.4	+1.7	+1.4	−4.5	+0.4	−0.2
Middle Atlantic	+1.1	−6.5	+2.8	−1.4	−1.3	+0.2	+3.5	+1.8	+1.1	+0.5	−4.2	−1.7	−0.3
South Atlantic	0.0	−6.1	+0.9	−5.8	0.0	−0.7	+1.1	+0.5	+0.4	+0.4	−4.9	−2.8	−1.4
Florida Peninsula	−0.5	−5.3	−2.0	−4.3	−0.2	−0.4	+0.2	−1.0	+0.2	+0.6	−4.6	−3.0	−1.7
East Gulf	+1.4	−5.5	−1.0	−4.9	−0.4	+0.9	+1.1	+0.4	−0.3	+0.2	−2.4	−4.9	−1.3
West Gulf	+5.9	−2.6	+0.5	−3.3	−0.1	+1.8	+1.9	+2.7	−0.1	+2.3	+2.4	−3.7	+0.6
Ohio Valley and Tennessee	+1.8	−7.1	+1.3	−4.7	−1.3	+1.2	+4.6	+1.0	−0.3	+1.7	−2.9	−5.4	−0.8
Lower Lakes	+1.1	−8.3	+1.6	+0.8	−1.0	+0.5	+4.4	+1.9	+1.0	+1.6	−2.5	−3.1	−0.2
Upper Lakes	+2.9	−4.6	+0.8	+3.3	+0.8	+1.2	+3.7	+2.0	+0.8	+2.9	+0.2	−2.9	+0.9
North Dakota	+6.5	+0.3	+5.5	+3.5	+7.2	−1.9	+3.6	+1.2	−2.6	+4.6	+2.1	−0.3	+2.5
Upper Mississippi Valley	+6.2	−5.6	+1.0	+0.3	+0.8	+3.1	+7.3	+2.4	+0.5	+3.7	+0.3	−5.1	+1.2
Missouri Valley	+9.0	−1.6	+2.4	+0.7	+2.2	+2.8	+8.3	+3.3	−0.7	+4.6	+3.0	−4.7	+2.4
Northern Slope	+7.3	−1.7	+2.8	+0.3	+5.9	−2.6	+4.9	+2.5	−3.0	+4.8	+5.8	+1.3	+2.4
Middle Slope	+5.4	−2.5	0.0	−2.2	+0.7	+3.1	+5.8	+3.3	+0.2	+4.0	+5.1	−2.0	+1.7
Southern Slope	+5.2	−2.3	+0.8	−2.6	−1.6	+2.0	+2.5	+2.9	+0.9	+4.0	+4.0	−1.8	+1.2
Southern Plateau	+8.1	+1.0	−1.0	−2.5	−1.4	−2.4	+1.4	+0.3	−1.2	+1.5	+4.3	+1.4	+0.8
Middle Plateau	+5.7	+2.8	+0.9	−1.1	+2.4	−2.7	+2.2	+0.9	−2.6	+4.0	+4.8	+2.2	+1.6
Northern Plateau	+4.0	+1.6	+2.2	−1.2	+3.4	−3.9	+1.7	+4.0	−3.0	+5.8	+4.7	+1.5	+1.7
North Pacific	+0.4	+1.4	−0.4	−2.5	−1.3	−3.2	−3.0	+1.2	−1.3	+5.0	+3.0	−0.3	−0.1
Middle Pacific	+0.3	+1.2	+1.7	−1.9	−1.5	−0.8	−1.2	−0.7	−1.7	+3.5	+2.0	+1.2	+0.2
South Pacific	+2.2	+2.1	+2.7	−1.6	−1.4	−0.7	0.0	+0.6	−2.6	+1.1	+2.1	+1.8	+0.5

TABLE B.—*Monthly and annual departures of precipitation from the normal during* 1901.

Districts.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
New England	−1.6	−2.6	+1.7	+3.0	+1.9	−1.0	−0.4	−0.5	−0.1	−1.6	−2.1	+3.6	+ 0.3
Middle Atlantic	−1.2	−2.5	−0.2	+1.8	+0.9	−1.1	−0.3	+2.4	−0.6	−1.8	−1.3	+2.6	+ 1.3
South Atlantic	−1.4	−0.2	−0.2	+0.1	+2.4	+0.7	−0.3	+0.6	0.0	−2.5	−1.9	+0.7	+ 2.0
Florida Peninsula	−0.3	0.0	+1.9	−0.8	+0.2	+2.9	−0.5	+2.4	0.0	−3.2	−1.7	+0.4	+ 1.3
East Gulf	−0.6	+0.1	−0.4	+1.4	+0.8	−2.2	+0.3	+1.6	−0.9	−1.3	−1.9	+2.6	− 0.5
West Gulf	−1.8	−1.6	−1.2	−0.9	−2.1	−2.6	+0.1	−0.9	+1.8	+0.7	−2.0	−0.8	−11.3
Ohio Valley and Tennessee	−1.8	−3.0	−0.8	+0.2	−0.2	−0.4	−2.4	+1.4	−0.1	−1.6	−2.4	+1.6	− 9.5
Lower Lakes	−0.6	−0.9	+0.1	+0.6	−0.5	−0.7	0.0	+1.0	0.0	−1.5	−0.8	+1.4	− 1.9
Upper Lakes	−0.8	−0.9	+0.8	−1.4	−1.4	−0.6	+1.3	−1.2	−0.6	−0.4	−1.0	−0.6	− 6.8
North Dakota	−0.3	−0.2	−0.1	−0.8	−2.0	+3.0	+1.0	−0.1	+0.7	+0.4	−0.5	+0.2	+ 1.3
Upper Mississippi Valley	−0.6	−0.8	+0.5	−1.3	−2.1	−0.6	−1.3	−1.6	0.0	−0.9	−1.2	−0.3	−10.2
Missouri Valley	−0.6	−0.2	+0.3	−1.0	−2.6	−0.1	−1.7	−1.1	+2.3	+0.2	−0.8	+0.2	− 5.1
Northern Slope	−0.4	0.0	0.0	+0.4	+0.3	+0.7	+0.1	−0.2	+0.7	−0.4	−0.2	+0.5	+ 1.5
Middle Slope	−0.6	−0.2	−0.6	+0.9	−1.2	−1.1	−1.5	−1.0	−0.2	+0.2	−0.3	−0.4	− 6.0
Southern Slope	−0.8	0.0	−1.0	+0.4	+0.8	−2.6	−1.7	−0.8	−0.6	−0.5	+0.5	−0.9	− 7.2
Southern Plateau	0.0	+1.6	−0.6	−0.1	+0.4	−0.2	−0.2	+0.4	−0.4	+0.3	−0.2	−1.1	− 0.1
Middle Plateau	−0.4	+0.7	−0.2	−0.1	+0.2	−0.1	−0.3	+1.0	−0.5	0.0	−0.4	−0.2	− 0.3
Northern Plateau	−0.4	+0.2	−0.5	−0.3	−0.1	−0.3	−0.2	−0.3	+0.8	−0.8	−0.3	−0.1	− 2.3
North Pacific	−0.1	+0.6	−1.2	+1.3	+0.4	−0.1	−0.3	−0.6	−0.1	−1.8	+3.5	−2.1	− 0.5
Middle Pacific	+1.0	+2.0	−2.8	+0.2	−0.7	−0.5	0.0	0.0	+1.2	−0.1	+0.9	−3.8	− 2.6
South Pacific	+1.8	+1.7	−1.6	−0.4	+0.5	−0.1	0.0	0.0	+0.1	+0.6	−0.5	−3.2	− 1.1

TABLE C.—*Monthly and annual departures of relative humidity from the normal,* 1901.

Districts.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October	November.	December.	Annual.
New England	− 1	−10	+ 1	+ 9	+ 4	− 3	+ 2	+ 3	0	− 1	− 4	+ 4	+0.4
Middle Atlantic	− 1	− 8	0	+ 1	+ 3	− 1	+ 5	+ 5	+ 2	− 1	− 6	+ 4	+0.2
South Atlantic	− 4	−11	− 5	− 6	+ 2	+ 2	0	+ 3	0	− 2	−10	− 1	−2.8
Florida Peninsula	− 4	− 7	− 4	− 7	− 2	− 1	0	0	+ 1	− 1	− 5	+ 1	−2.4
East Gulf	− 4	−10	− 8	− 8	− 5	− 3	− 4	+ 1	0	− 3	− 9	− 1	−4.5
West Gulf	− 3	+ 2	− 4	− 3	0	− 2	− 3	− 3	− 1	+ 1	− 2	− 2	−1.7
Ohio Valley and Tennessee	− 2	− 1	0	+ 5	− 1	+ 2	− 4	+ 5	+ 3	+ 2	− 2	+ 6	+1.1
Lower Lakes	− 1	0	+ 1	+ 2	+ 6	0	+ 2	+ 5	0	− 3	0	+ 4	+1.3
Upper Lakes	+ 2	+ 1	+ 5	− 3	+ 4	+ 3	+ 2	+ 3	+ 2	0	− 1	+ 3	+1.8
North Dakota	− 1	− 2	+ 2	+ 5	− 7	+ 6	+ 8	+ 6	+11	+ 5	+ 3	+ 2	+3.2
Upper Mississippi Valley	+ 1	+ 1	+ 3	0	− 2	− 5	−11	− 6	− 2	− 2	− 4	+ 6	−1.8
Missouri Valley	−10	− 2	− 4	+ 1	− 5	− 6	−13	− 7	+ 1	+ 3	− 5	+ 4	−3.6
Northern Slope	+ 1	+ 9	+ 2	+ 5	+ 7	+ 8	+ 2	+ 8	+15	+ 9	+ 4	+10	+6.7
Middle Slope	− 4	+ 6	− 2	+ 9	+ 2	− 5	−11	− 2	+ 4	+ 7	0	+ 5	+0.8
Southern Slope	−10	0	−13	+ 2	+ 6	−10	− 3	− 8	+ 3	+ 4	+ 7	− 6	−2.3
Southern Plateau	− 3	+ 8	− 4	+ 3	+ 6	− 2	− 3	− 3	− 5	− 2	+ 4	−11	−1.0
Middle Plateau	− 2	+14	+ 3	+ 3	+ 3	− 1	− 1	+12	− 3	+ 9	+ 2	− 3	+3.0
Northern Plateau	− 1	+ 1	0	0	+ 1	+ 1	− 2	− 2	+ 6	0	− 3	− 1	0.0
North Pacific	+ 1	− 7	− 1	− 5	− 2	− 4	− 6	− 8	− 5	− 1	− 1	0	−3.2
Middle Pacific	0	+ 4	−10	− 9	0	− 9	− 8	− 5	− 4	− 4	+ 8	−13	−4.2
South Pacific	− 3	+ 3	− 7	− 2	+ 4	0	0	+ 3	+ 3	+ 2	+11	−14	0.0

TABLE D.—*Monthly and annual departures of average cloudiness from the normal*, 1901.

Districts.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
New England	+0.6	−1.1	+1.1	+2.1	+1.1	−0.9	+1.1	+0.6	−0.5	−0.9	+1.0	+0.6	+0.4
Middle Atlantic	+0.3	−1.1	+0.4	+1.4	+1.2	−0.4	+0.7	+0.6	−0.1	−1.0	+0.3	+0.5	+0.2
South Atlantic	−0.3	−1.0	−0.2	+0.3	+0 8	+0.2	0.0	+0.3	−0.1	−1.1	−1.2	+0.4	−0.2
Florida Peninsula	−0.5	−0.5	−0.4	−0.6	−0.5	+0.5	+0.6	+0.6	+0.4	+0.1	−1.2	+0.3	−0.1
East Gulf	−0.7	0.0	−0.4	0.0	−0.1	−0.4	0.0	+0.5	+0.1	−1.2	−0.9	+0.6	−0.2
West Gulf	0.0	+0.4	−1.5	−0.6	−0.3	−1.1	+0.2	−0.6	−0.1	−0.5	−0.2	−1.1	−0.4
Ohio Valley and Tennessee	−0.2	−0.4	+0.3	+0.7	+0.2	−0.8	−1.1	+0.6	−0.4	−1.4	−1.0	+0.6	−0.2
Lower Lakes	+0.7	+0.5	+0.9	+0.5	+1.0	0.0	−0.3	+0.9	−0.2	−0.9	+0.2	−0.1	+0.3
Upper Lakes	+0.5	−0.5	+1.3	−0.5	+0.6	0.0	+0.3	+0.1	+0.5	−0.5	+0.6	+0.5	+0.2
North Dakota	−0.4	−1.1	−0.5	+0.1	−2.2	+0.5	−0.6	−0.2	+1.6	−1.0	−1.0	+1.1	−0.3
Upper Mississippi Valley	−0.3	−1.0	+1.0	−0.4	−0.5	−0.7	−1.1	−0.6	+0.2	−0.5	−1.3	+0.8	−0.4
Missouri Valley	−0.9	−0.8	+0.1	−0.3	−1.2	−0.6	−1.6	−0.8	+0.5	+0.3	−0.8	+0.6	−0.5
Northern Slope	0.0	+0.1	−0.1	−0.2	−0.6	+0.5	−1.2	−0.7	+1.2	−0.8	0.0	+1.0	−0.1
Middle Slope	0.0	+0.8	+0.1	+0.8	−0.2	−0.3	−0.6	0.0	+0.8	+0.7	+0.4	+0.6	+0.3
Southern Slope	+1.1	+0.6	−0.6	0.0	+0.1	−1.6	+0.2	−1.1	+0.8	+1.4	+0.9	−0.8	+0.1
Southern Plateau	+0.6	+0.8	−0.6	+0.4	+0.4	−0.4	−0.4	−0.5	−1.0	+0.8	+0.7	−1.0	0.0
Middle Plateau	+0.2	+2.0	−0.1	+0.3	+0.6	+0.2	+0.1	+1.4	−0.9	+0.9	+1.0	−0.8	+0.4
Northern Plateau	−0.3	−0.3	−0.7	−0.9	+0.1	+0.4	−1.1	+0.1	+1.0	−1.2	+0.6	−0.5	−0.2
North Pacific	+0.4	−0.7	+0.5	−0.4	+0.7	+0.4	+0.5	−0.6	+0.1	+0.2	+1.3	+0.3	+0.2
Middle Pacific	+0.5	+1.4	−1 3	−0.9	+0.2	−0.6	−0.4	+1.3	+0.8	+1.0	+2.2	−2.1	+0.2
South Pacific	+0.9	+0.5	−1.6	−0.6	+0.6	−0.3	−0.6	+0.2	0.0	+0.2	+0.9	−1.7	−0.1

SPECIAL CONTRIBUTIONS.

CLIMATOLOGY OF COSTA RICA.

Communicated by H. PITTIER, Director, Physical Geographic Institute.

TABLE 1.—*Hourly observations at the Observatory, San Jose de Costa Rica, during December*, 1901.

Hours.	Pressure.		Temperature.		Relative humidity.		Rainfall.		
	Observed, 1901.	Normal, 1889–1900.	Observed, 1901.	Normal, 1889–1900.	Observed, 1901.	Normal, 1889–1900.	Observed, 1901.	Normal, 1889–1900.	Duration, 1901.
	660+ *Mm.*	660+ *Mm.*	°*C.*	°*C.*	%	%	*Mm.*	*Mm.*	*Hrs.*
1 a. m	3.60	3.64	16.40	16.46	85	87	0.0	0.5	0.00
2 a. m	3.21	3.22	16.13	16.33	86	87	0.0	1.9	0.00
3 a. m	2.98	2.96	15.74	16.23	88	87	0.0	0.4	0.00
4 a. m	3.05	3.02	15.42	16.06	88	87	0.0	0.5	0.00
5 a. m	3.24	3.28	15.42	16.00	87	87	0.0	1.5	0.00
6 a. m	3.50	3.63	15.42	16.01	87	87	0.0	1.3	0.00
7 a. m	3.86	4.10	16.66	17.01	81	83	0.0	1.1	0.00
8 a. m	4.18	4.47	18.72	18.61	72	78	0.0	0.9	0.00
9 a. m	4.35	4.67	20.76	20.48	68	73	0.0	0.6	0.00
10 a. m	4.42	4.62	22.38	21.84	65	69	0.0	0.5	0.00
11 a. m	4.08	4.32	23.35	22.58	64	67	1.3	1.8	0.66
12 m	3.57	3.76	23.93	23.08	64	67	2.5	2.0	1.17
1 p. m	2.97	3.17	24.76	23.24	64	67	1.0	2.1	0.83
2 p. m	2.59	2.77	23.69	22.34	65	68	2.6	2.7	2.60
3 p. m	2.37	2.42	22.80	22.24	67	69	3.4	2.4	1.25
4 p. m	2.36	2.52	21.28	21.09	73	74	1.2	5.5	0.58
5 p. m	2.60	2.75	19.72	19.73	75	77	3.0	3.0	1.42
6 p. m	2.92	3.16	18.90	18.64	80	81	5.5	2.0	2.42
7 p. m	3.39	3.67	18.52	18.04	82	83	0.1	2.3	0.75
8 p. m	3.84	3.97	18.14	17.69	83	84	0.3	1.1	1.00
9 p. m	4.21	4.42	17.77	17.41	84	85	0.0	1.3	0.00
10 p. m	4.34	4.48	17.36	17.07	85	86	0.0	1.2	0.00
11 p. m	4.25	4.31	16.93	16.85	85	86	2.0	1.8	0.92
Midnight	4.06	4.01	16.52	16.62	86	87	2.3	0.8	0.92
Mean	3.50	3.54	18.98	18.63	78	80	.....	.....	.....
Minimum	660.4	659.23	11.9	9.2	.....	.....	.....	.....	.....
Maximum	668.3	667.82	29.3	29.2	.....	.....	2.3	.....	.....
Total	.....	.....	.....	.....	.....	.....	25.2	39.0	13.92

REMARKS.—The barometer is 1,169 meters above sea level. Readings are corrected for gravity, temperature, and instrumental error. The dry and wet bulb thermometers are 1.5 meters above ground and corrected for instrumental errors. The hourly readings for pressure, wet and dry bulb thermometers, are obtained by means of Richard registering instruments, checked by direct observations every three hours from 7 a. m. to 10 p. m. The hourly rainfall is as given by Hottinger's self-register, checked once a day. Under maximum, the greatest hourly rainfall for the month is given. The standard rain gage is 1.5 meters above ground. In the Costa Rican system the San Jose local time is used, which is $0^h\ 36^m\ 13.3^s$ slower than seventy-fifth meridian time.

TABLE 2.

Time.	Sunshine.		Temperature of the soil at depth of—					Cloudiness observed, 1901.
	Observed, 1901.	Normal, 1889–1900.	0.15 *m.*	0.30 *m.*	0.60 *m.*	1.20 *m.*	3.00 *m.*	
	Hours.	*Hours.*	°*C.*	°*C.*	°*C.*	°*C.*	°*C.*	$
7 a. m	6.83	4.89	19.12	19.33	19.98	20.51	21.00	36
8 a. m	22.75	17.86	.....	.....	.....	.....	.....	.....
9 a. m	24.00	18.54	.....	.....	.....	.....	.....	.....
10 a. m	18.91	17.43	19.38	19.41	20.01	20.53	.....	51
11 a. m	17.68	15.40	.....	.....	.....	.....	.....	.....
12 m	17.16	13.98	.....	.....	.....	.....	.....	.....
1 p. m	14.98	14.17	19.74	19.55	20.03	20.50	.....	62
2 p. m	16.76	14.95	.....	.....	.....	.....	.....	.....
3 p. m	16.61	14.82	.....	.....	.....	.....	.....	.....
4 p. m	14.40	14.08	19.84	19.58	20.03	20.44	.....	67
5 p. m	7.99	9.85	.....	.....	.....	.....	.....	.....
6 p. m	1.41	1.77	.....	.....	.....	.....	.....	.....
7 p. m	.....	.....	19.76	19.59	20.03	20.42	.....	56
8 p. m	.....	.....	.....	.....	.....	.....	.....	.....
9 p. m	.....	.....	.....	.....	.....	.....	.....	.....
10 p. m	.....	.....	19.63	19.57	20.00	20.40	.....	41
11 p. m	.....	.....	.....	.....	.....	.....	.....	.....
Midnight	.....	.....	.....	.....	.....	.....	.....	.....
Mean	.....	.....	19.60	19.51	20.00	20.46	21.00	55
Total	179.48	157.74	.....	.....	.....	.....	.....	.....

TABLE 3.—*Rainfall at stations in Costa Rica, December*, 1901.

Stations.	Amount.	No. rainy days.	Stations.	Amount.	No. rainy days.
	Mm.			*Mm.*	
1. Sipurio (Talamanca)	310	16	14. Juan Vinas	109	9
2. Boca Banano	366	24	15. Santiago	174	14
3. Limon	284	15	16 Paraiso	43	9
4. Swamp Mouth	.....	.....	17. Las Concavas	38	13
5. Zent	391	14	18. Cartago	68	14
6. Gute Hoffnung	.....	.....	19. Tres Rios	57	9
7. Siquirres	396	10	20. S. Francisco G	27	9
8. Guapiles	417	18	21. San Jose	25	11
9. Sarapiqui	689	24	22. La Verbena	145	5
10. San Carlos	175	18	23. Nuestro Amo	.....	.....
11. Las Lomas	490	16	24. Alajuela	.....	.....
12. Turrialba	.....	.....	25. San Isidro Alajuela	52	5
13. Peralta	304	18			

Notes on the weather.—On the Pacific slope, fine weather, without any excess of temperature or humidity, prevailed up to the 28th, after which there came a succession of stormy and relatively icy days. On the 31st, 10 a. m., the highest

pressure since 1888 was recorded at San José (668.3 mm.) and the same day was also the coldest in fourteen years of observations, the mean temperature of the twenty-four hours being 14.23° C. On the Atlantic slope rainy days prevailed all through the month, with several storms, the exact dates of which could not be obtained.

Earthquakes.—December 27, 10^h a. m., tremors. December 30, 10^h 10^m p. m., slight tremors.

CLIMATOLOGICAL DATA FOR JAMAICA.

Through the kindness of Mr. Maxwell Hall, the following data are offered to the MONTHLY WEATHER REVIEW in advance of the publication of the regular monthly weather report for Jamaica:

Comparative table of rainfall for December, 1901.
(Based upon the average stations only)

Divisions.	Relative area.	Number of stations.	Rainfall.	
			Average.	1901.
			Inches.	*Inches.*
Northeastern division	25	21	9.45	8.38
Northern and subcentral division	32	54	5.60	6.17
Western-central division	36	24	3.91	4.30
Southern division	27	32	2.66	2.62
General means	100	131	5.40	5.37

In taking the average rainfall Mr. Hall uses only those stations for which he has several years of observation, so that the column of averages represents fairly well the normal rainfall for each division, while the column for the current month represents the average rainfall at those same stations. The relative areas of the divisions are very nearly the same and are given in the preceding table as expressed in percentages of the total area of Jamaica. The number of rainfall stations utilized in each area varies slightly from month to month, according as returns have come in promptly or not, but will not differ greatly from the numbers in the second column of the table.

Jamaica, W. I., climatological data, December, 1901.

	Negril Point Lighthouse.	Morant Point Lighthouse.
Latitude (north)	18° 15′	17° 55′
Longitude (west)	78° 23′	76° 10′
Elevation (feet)	33	8
Mean barometer, 7 a. m.	29.936	29.925
Mean barometer, 3 p. m.	29.878	29.880
Mean temperature, 7 a. m	75.0	78.6
Mean temperature, 3 p. m	82.1	83.1
Mean of maxima	85.3	.....
Mean of minima	72.7	.....
Highest maximum	89.0	.....
Lowest minimum	68.0	.....
Mean dew-point, 7 a. m	69.9	.....
Mean dew-point, 3 p. m	71.5	.....
Mean relative humidity, 7 a. m.	84.0	.....
Mean relative humidity, 3 p. m.	71.0	.....
Total rainfall (inches)	0.78	7.88
Average wind direction, 7 a. m	ne.	nne.
Average wind direction, 3 p. m	nne.	nne.
Average hourly velocity, miles, 7 a. m	8.8	12.2
Average hourly velocity, miles, 3 p. m	12.3	14.2
Average cloudiness (tenths):		
7 a. m. Lower clouds	2.1	1.6
7 a. m. Middle clouds	1.7	1.8
7 a. m. Upper clouds	1.7	1.0
3 p. m. Lower clouds	0.6	2.1
3 p. m. Middle clouds	5.0	2.0
3 p. m. Upper clouds	1.7	0.9

NOTE.—The pressures are reduced to standard temperature and gravity, to the Kew standard, and to mean sea level. The thermometers are exposed in Stevenson screens.

REPORT OF THE CHIEF OF THE WEATHER BUREAU FOR THE YEAR ENDING JUNE 30, 1901.[1]

Dated July 22, 1901.

OCEAN FORECASTS AND INTERNATIONAL COOPERATION.

An important extension of the forecast work of the Bureau was made during the year. By an arrangement with the secretary of the meteorological office at London, England, the transmission by cable from London to Washington of meteorological reports from certain points in the British Isles and on the Continent of Europe, and from Ponta Delgada, Azores, was begun December 18, 1900. These reports, with observations from Nassau, Bermuda, and Turks Island, have been regularly published on the daily weather maps issued at Washington, Baltimore, Philadelphia, New York, and Boston, together with forecasts of the force and direction of the wind and the state of the weather for the first three days out of steamers bound east from American ports.

The Atlantic forecasts, which are based on the American, Atlantic, and European telegraphic reports, were begun January 7, 1901, and on June 1, 1901, they were made a part of the regular general night forecasts issued at Washington. In a number of instances, when storms of marked strength were passing eastward off the American coast, forecasts were issued of the character of the weather which would probably be experienced by steamers leaving European ports westward bound, and by an arrangement with Lloyd's, of London, these advices have been cabled to England.

In addition to the daily forecasts of wind and weather and special storm warnings, predictions of fog were issued when conditions favorable for fog development had been indicated in the steamer tracks west of the fiftieth meridian. Reports from transatlantic steamships show that these forecasts and special warnings have been well verified.

In November, 1900, arrangements were made with Portugal to receive reports from the meteorological observatory at Horta, in the Azores. Observations are now regularly received by cable from that place, and they are of much value in the work of forecasting the movements of storms on the Atlantic Ocean.

NEW FORECAST DISTRICTS.

Three additional forecasting districts have been established and designated as the New England district, the West Gulf district, and the Rocky Mountain district, with headquarters at Boston, New Orleans, and Denver, respectively. The last appropriation bill passed by Congress made provision for three additional forecast officials to be placed in charge of these districts with authority to issue forecasts and warnings for the several States that are comprised in each district. This system has the advantage of enabling each forecaster to devote more time to the consideration of the predictions for each district and of securing an earlier distribution of forecasts. As these forecast officials were selected on account of their

[1] We reprint herewith the Annual Report of the Chief of the Weather Bureau to the Secretary of Agriculture, omitting only the sections devoted to the Galveston Hurricane, and Frost and Flood warnings, which are made up largely of matter that has already appeared in the REVIEW. This report contains much that is of interest to our many voluntary observers, and which they will probably not see elsewhere.

ability as forecasters for their respective sections, it is expected that an improved service will result.

IMPROVEMENT IN FORECASTS.

Special consideration has been given to the subject of increasing the accuracy of the forecasts of the Weather Bureau to the highest degree attainable, and, as a means of stimulating among the employees of the Bureau the study of the problems of weather forecasting, announcement has been made that hereafter marked success in forecasting, the invention of new methods of forecasting, or the discovery of new facts or principles of marked value to the forecaster, will have a special weight when the merits of employees, of whatever grade, for promotion are considered.

The forecasters of the central office at Washington have been relieved, as far as possible, of all other routine work, and they will devote their whole time and energies to forecast duty. These forecasters, when not detailed at the daily work of forecasting, will engage in studies that aid them in their work. It is believed that this arrangement will result in an improvement of the forecasting work of the service.

CLIMATE AND CROP WORK.

The lines of work pursued in previous years by the climate and crop service of the Weather Bureau were continued, and extensions and improvements made wherever possible. The cotton-region service has been extended into Oklahoma and the Indian Territory, and arrangements have been made for inaugurating a similar work in California, to be known as the fruit and wheat service.

Few persons realize what a complete system the Weather Bureau forms for the accurate and rapid collection and dissemination of crop information. It has 1,200 paid and skilfully trained officials outside of Washington, who are quite evenly distributed over the United States and its island possessions, and who are available to report on any matters concerning weather, crops, climate, or statistics. It has 200 officials and employees at the central office in Washington. It has 180 fully equipped meteorological stations quite equidistantly scattered over the United States and its dependencies, each manned by from one to ten trained officials, which stations are not only weather observatories, but are centers for the gathering of statistical and climate and crop reports. It has a central observatory in each State and Territory, to which all subordinate offices in the State report, and to which all voluntary weather and crop observers report. These central observatories are equipped with printers, printing plants, trained meteorologists and crop writers, clerks, and messengers.

The State central offices are under the systematic direction of the central office at Washington. The central office at Washington is equipped with cartographers, printers, pressmen, lithographers, and elaborate addressing and mailing appliances for the printing and mailing of large quantities of National weekly, monthly, quarterly, or annual reports and bulletins. The telegraph circuits of the Weather Bureau are ingeniously devised for the rapid collection, twice daily, of meteorological reports; they are also used to collect the weekly National crop bulletin. The Bureau has 315 paid temperature and rainfall reporters who are now daily telegraphing their data from the growing fields to certain cotton, corn, and wheat centers. It has 250 storm-warning displaymen distributed among the ports along the Atlantic, Gulf, and Pacific coasts and in the lake region. It has an observer serving each morning on the floor of each important board of trade, commercial association, or cotton or maritime exchange in the country, who displays weather and crop information, and each day charts the weather reports on a large map. It has 3,000 voluntary observers—nearly one for each county in the United States—equipped with standard thermometers, instrument shelters, and rain gages, who have for years intelligently served the Government by taking daily weather observations and rendering weekly crop reports to State central offices. There are 14,000 persons reporting weekly to the climate and crop centers as to the effect of weather upon the crops in their respective localities. These voluntary crop correspondents could quickly be increased in number to several hundred thousand if occasion required. In four weeks there are printed and distributed 168 different State crop bulletins, four National crop bulletins, and 42 monthly eight-page State climate and crop bulletins. The weekly State crop bulletins are written by the directors of the different State sections, and the weekly National crop bulletin by Mr. James Berry, chief of the climate and crop division of the Weather Bureau, a man who has had many years experience as a writer on crop conditions in the United States.

FORECASTS BY RURAL FREE DELIVERY.

Particular attention has been given to the distribution of forecasts by means of the rural free delivery. There are now in operation 365 centers supplying an aggregate of nearly 42,000 families in the farming districts with the latest weather predictions. This work has become decidedly popular, and we have had the hearty cooperation of the Post-Office Department in making it a success.

Estimate has been made for additional appropriation with which to extend the distribution of forecasts and warnings by this method. The rural free delivery places the frost and cold-wave warnings in the hands of those who can make the most valuable use of them. It is expected that the Bureau will reach several hundred thousand farmhouses with the daily forecast before the expiration of the coming year.

MOUNTAIN SNOW BULLETINS.

The local snow bulletins that are issued by the State centers in the Rocky Mountain region are meeting a very important need. These bulletins give complete information as to the depth and character of snowfall in the mountains—data that have such an important bearing on summer water supply for irrigation purposes.

ETHERIC SPACE TELEGRAPHY.

Substantial improvements have been made during the past year in the Weather Bureau system of wireless telegraphy. The line of research has been divided into three classes: First, the perfection of a more powerful transmitter, in which the energy of radiation shall be greatly increased; second, the devising of a more delicate receiver, one that would be positive instead of depending upon an imperfect and variable contact, as do all systems now in use; and, third, the perfection of a system of selective telegraphy, whereby messages can be differentiated, so that only the receiver for which the message is intended shall become responsive to the waves of ether.

The first of these problems may be said to have been successfully solved, and a transmitter devised capable of radiating all the energy generated; the second is believed to be nearing a successful solution; the third is thought to be well demonstrated theoretically, but has not been fully tested in practise.

While there is much experimental work yet to be done before our system, or any system of which I have knowledge, is reliable for intership communication, or before any two

systems can work within the same field without each rendering the other useless, such progress has been made by the Government experimenters that, with no interference by private systems, stations can be successfully operated over at least 150 miles of coast line, and they are now in operation on the North Carolina and Virginia coasts, and soon will be instituted between the Farallone Islands and the mainland, and Tatoosh Island and the mainland, on the Pacific coast.

If a system of selective telegraphy can not be perfected so that one system does not interfere with and render useless another, and thereby prevent all use to commerce of recent discoveries in wireless telegraphy, it may become necessary, on account of the value of these discoveries to our marine interests, for the Government to take exclusive control of all systems of etheric space telegraphy and to establish stations along our extensive coast lines at such distances and in such relation, the one to the other, that they shall not interfere. Even then there will occasionally be difficulty in communicating with the mainland whenever two ships in close proximity are attempting to transmit or receive messages at the same time.

DESTRUCTION OF HAILSTORMS WITH CANNON.

Considerable interest has been aroused among agriculturists in the United States relative to the prevention of hailstorms by the use of explosives fired from specially designed cannon. The experiments conducted along this line by grape growers of France and Italy have aroused popular interest in this country. The theory is not a new one, though perhaps not so ancient as the idea that precipitation occurs soon after and as a result of the explosives used in battles. As early as 1769 the Marquis de Cheviers, a retired naval officer of France, thought that he could combat the scourge of hailstorms by the firing of cannon, but his experiments, like those conducted by many others at various times during the past century, were not productive of definite results.

One of the most serious drawbacks to grape culture in Europe is the destruction caused by hail, and the growers are naturally interested in anything that promises to give immunity from such damage. During the past two or three years renewed interest has been taken in the matter by the vineyardists of certain parts of France and Italy. Several manufacturers have placed upon the market a special form of cannon, which they claim will effectively break up hail-bearing clouds. The belief in the efficacy of this method of protection has become quite general in Europe, although scientists versed in the physics of the air have not expressed confidence in the system.

In brief, the apparatus in use consists of a cannon fitted with a funnel-shaped conical extension. The difference between the various forms of cannon that are used lies mainly in the shape and size of the funnel extensions and the size of the powder charges. Usually the cannon are fired vertically upward, although in some instances the apparatus is inclined toward an advancing cloud. The effect of the funnel attachment is to cause the formation of a mass of rapidly-revolving air, or vortex, which leaves the mouth of the cannon with tremendous velocity. In shape these vortices can be likened somewhat to the rings or puffs of smoke made by a person smoking a cigar. It is claimed that these whirling masses of air, intermixed with gases from the explosives, are forced upward to a sufficient height to enter the hail cloud and destroy its hail-forming processes. If it is granted that these rings ascend to a sufficient height to enter the cloud, I am of the opinion that the force of the ring is too puny to have any appreciable effect on the cloud.

Many experiments have been made for the purpose of ascertaining the actual height to which these air rings rise before being dissipated. In a report by Profs. J. M. Pernter and W. Trabert, who, at the invitation of the Imperial Department of Agriculture of Austria and of the inventor of one of the methods, made as complete an investigation as was possible, and, under various conditions, these scientists stated that they were not able to report anything positive as to the value of hail shooting. They reported that, using the largest cannon and the heaviest charges, the vortices did not ascend to a height of 1,000 feet on an average, although in some instances greater distances were obtained.

There is a marked difference of opinion as to the effectiveness of cannon firing, with the manufacturers and many grape growers on the one side and the scientists of America and Europe on the other. The former maintain that hailstorms can be prevented in the manner described, while the latter claim that the force exerted by the explosives is infinitesimal as compared to the forces of nature that are exerted in hail formation, and that experiments conducted by the adherents of the cannonading process themselves have not produced convincing results. The number of thunderstorms from which hail is precipitated is but a small percentage of the actual number. In most localities of the United States a whole season sometimes passes without a fall of hail, while in seasons of abnormal thunderstorm frequency the number of hailstorms is small. While in the grape-growing regions of France and Italy there may be greater hailstorm frequency, it is still true that the number of hailstorms are few as compared to the number of thunderstorms without hail. The experimenters score a success whenever they shoot at a thunderstorm cloud that does not produce hail, although the chances are greatly in favor of there being no hail in the cloud. Again, they excuse the occurrence of hail in spite of a bombardment by saying that the cannon was not large enough or the powder charge sufficiently heavy, and declare that the hailstorm was far less severe than it would otherwise have been. How is one either to prove or disprove such statements?

It is true that many important discoveries have been made by experiments that were conducted contrary to scientific theories, and in the matter under discussion it is not our intention to overweight the scientist or to underestimate the practical investigator, but unquestioned facts and not explanations must be the proof of results. Scientists both in America and in Europe declare that hailstorms can not be prevented by the use of cannon and explosives of even greater power than have been used or that it is possible for man to use, and they base their belief on such knowledge of the forces of nature as science has revealed. Those opposed attempt to break down the scientists' argument by declaring that no one has yet satisfactorily explained the processes of hail formation. This is true to a certain extent, but enough is known upon which to base a logical opinion.

But there are reasons for believing that the use of cannon and explosives in preventing hailstorms is not effective. Mr. Stiger, one of the inventors of the apparatus in use, claims that hail is formed in quiet spots in the atmosphere, where atmospheric moisture crystalizes out in large crystals in a manner analogous to the formation of large crystals of salt in liquid solution. I agree with Professor Abbe that there are no such quiet spots in the atmosphere, and hailstones are not crystals, but masses of ice with only a partial crystaline structure. Even the perfect crystals of the snowflake are formed in the midst of rapidly moving air. Hailstorms are generally local and very erratic. Some have maintained that they are controlled by the hills or the contour of the ground or by the presence of forests and lakes, and this may be true to a certain degree; but, practically, the whole question is one of ascending and descending currents that characterize whirlwinds and thunderstorms.

Several thousand shooting stations have been established

in Italy and France during the past two years, but reports received from them give no definite data in support of the success of the experiments, although there is no doubt that the cannonading is believed to be effectual by the farmers who do the work. Waves of irrational enthusiasm sometimes sweep over a community, only to be regretted in subsequent years when calmer judgment has come to prevail. We have but to remember the experience of our own country only a few years ago with the rain makers, and how firm was the belief of thousands of people in the subarid and arid regions of the West that the use of powerful explosives would produce rainfall.

Thousands of dollars were expended in these experiments before the absurdity of the claim was demonstrated. It is a fact worthy of remark that the hail shooters are now using practically the same methods to dissipate the clouds that the rain makers used to produce them. Time and experiment will probably demonstrate that hail prevention by such means is as impracticable as rain production. The fact that 15,000 or 20,000 shooting stations have been established is of itself no argument as to the efficiency of the process. One might as well argue that the moon really affects the weather because a million people believe it and can prove it—to their own satisfaction.

A knowledge of the exact truth on any question of natural science is not easily attained. The hail cannonaders base their reports of success upon such statements as "a black cloud was seen approaching, cannon were fired, and the cloud passed over without hail," or "it passed to one side and the hail did not fall on the protected vineyard, and there the hail ceased," or "the cloud broke in two, passing to the right and left, leaving the sky cloudless over the cannon." Now these are quite common cloud and storm phenomena, and they will frequently happen without cannonading. There is no way of telling by the sight of an approaching cloud whether or not is accompanied by hail. Therefore, if the cannon be used every thunderstorm would have to be bombarded, although statistics have demonstrated that only one thunder cloud out of a great number contains hail. In other words, there would be a tremendous waste of time, money, and energy in unnecessary bombardments.

After examining all that has been published during the past two years on the subject of hail prevention, I have to repeat the opinion heretofore expressed that we have here to deal with a popular delusion, and that efforts should be made to prevent its spread in this country. The great processes going on in the atmosphere are conducted on too large a scale for any man or any nation to attempt to control them. According to Professor Abbe, the energy expended by nature in the production of a hailstorm, a tornado, or a rainstorm probably exceeds the combined energy of all the steam engines and explosives in the world. It is useless for man to attempt to combat nature on this scale.

THE MERIT SYSTEM AND THE DISCIPLINE IN THE WEATHER BUREAU.

A system of merit and discipline has been gradually developed in the Bureau, which not only conforms to the letter of the Civil Service law, but carries its spirit to a logical conclusion. The system compels each employee or official to work out his own official salvation. It is fair to all; it enables honest and efficient persons to work themselves upward; it contributes to a high standard of manly character and to efficiency in public office, and it holds back those of mediocre attainments or of slothful habits.

The duties of the Bureau are exacting. It requires a strict discipline to administer a service with such extensive ramifications, and to have every man at his post of duty at exactly the same moment of time. To do this several times each twenty-four hours, as is necessary in the gathering and the charting of simultaneous weather observations, and in the rapid dissemination back to the country of the forecasts and warnings based upon the observations, the observers must be tractable, prompt to respond to orders, which often come by telegraph, and possessed of more than the average of education and intelligence.

The Secretary of Agriculture has given his unqualified approval to existing plans for the gradual intellectual growth and development of the clerks, observers, and other officials of the Weather Bureau.

It has been the purpose of the Chief of the Bureau to recognize only the needs of the Weather Bureau and the merits of its employees in all matters of promotion, reduction, removal, or appointment, and to make only such recommendations to the Secretary as would meet his demands for an efficient service and inspire confidence among the workers of the Bureau in the fairness of the recommendations of the Chief. The Secretary has been liberal in recognizing the meritorious workers of the Bureau; he expects a high standard of fitness in return.

Even before the Executive order requiring that a classified employee be given opportunity to answer charges before removal, no employee of the Weather Bureau was removed without a full investigation of his offense, and in no case was removal made of a person properly performing his duties. No person shown to be incompetent or unfit for the public service has been retained in the Bureau; and, except in one case where removal was made without the knowledge that the employee had not been given the opportunity to retrieve himself that the Chief had directed, no person removed for either inefficiency or bad conduct has been reinstated.

It should not be supposed that promotion can be gained simply by passing the educational test. On the contrary, an employee must (1) make a good record for aptitude, efficiency, industry, and manly character, and (2) pass the educational test considered necessary to qualify him for the duties of the next higher grade.

Efficiency is determined from the observation of the work of the employee by his immediate official superiors, and by the general appearance and the accuracy of such of the employee's work as may come under review at the central office in Washington.

Character is determined by the personal opinion of the employee's official superiors with regard to his general behavior as an officer, his social affiliations, his neatness of dress, his integrity of character, and his observances of the courtesies of business life.

Educational qualifications are determined by examination in the following subjects: English grammar, practical arithmetic, algebra (through quadratics or equations of the second degree), plane elementary trigonometry, elementary physics, popular astronomy, elementary plant physiology, and meteorology.

The educational qualifications for promotion are apportioned as follows:

For promotion to grade of $1,000 or more per annum—English grammar, practical arithmetic, and elementary meteorology.

For promotion to grade of $1,200 or more per annum—Elements of algebra through quadratics, elements of plane trigonometry, and elementary physics.

For promotion to grade of $1,400 or more per annum—Popular astronomy, elementary plant physiology, and meteorology.

A proficiency of 70, on a scale of 100 as perfect, is required to pass each of the subjects.

The foregoing examinations are not obligatory, and failure

to take them will not of itself be made the cause of reduction. Failure to take these examinations, and thereby to become qualified for promotion, will be construed simply as an evidence of satisfaction with the grade held at the time and a tacit indication of no desire for advancement.

In order that a high standard of official integrity and manly character may obtain throughout the various branches of the Weather Bureau, it is required that a firm yet kind discipline be maintained by all officials in charge of stations. For the preservation of the peace of their offices and the efficiency of the public service, they are enjoined not to permit one subordinate secretly to impeach the integrity of another, or to carry tales about his companions. Every complaint must be stated either in the presence of the one against whom it is directed, or else in writing and be referred to him for answer, so that no unjust impression may find lodgment in the mind of a supervising officer.

The new appointee is selected from a list of eligibles certified by the United States Civil Service Commission. He can not be certified until he has passed an examination by the Commission in spelling, arithmetic, penmanship, copying from rough draft, meteorology, English composition, geography, and algebra; nor if he be under 18 or over 30 years of age. The applicant is appointed for a probationary period of six months. In each case the appointee is informed in writing and required to acknowledge the receipt of the communication, to the effect that the policy of the Bureau, under the direction of the Department, is to recommend for absolute appointment only those persons who show complete fitness for the work of the Bureau, and he is especially cautioned that no consideration except his own worth and value to the service will have any weight whatever in determining the matter of his retention.

Experience has demonstrated the wisdom of thus impressing upon a young man's mind the idea that, beginning with the very first day of his connection with the Bureau, he stands upon his own merit. It induces him to take up his work with a purpose and determination to earn, and therefore attain, permanency of position, with results generally gratifying to him and beneficial to the public service.

Once a month throughout the probationary period the official under whose immediate supervision the employee is placed renders a report on the conduct, service, and progress of the probationer, and this official is held strictly responsible that the reports be full and impartial. If after the trial period it is clearly shown that the appointee is morally, mentally, and physically qualified, permanent appointment is made. While the rules laid down for the guidance of probationers are exacting, yet it is required that they be applied with the utmost fairness, and when early reports indicate that the prescribed standard has not been maintained, admonition is sent at once to the employee when time remains for improvement; but undesirable employees are not retained after the expiration of six months, even on the ground sometimes put forth that they may qualify if given more time to develop.

The efficiency of the service can only be maintained by a rigid system of selection, and only those fully fitted to meet the exacting requirements of the Weather Bureau receive recommendation for permanent appointment.

As an illustration of the results that may be expected to follow after a just system of promotion has been inaugurated in a Government bureau, and adhered to for several years, I point to the fact that although it was known to every person in the Weather Bureau that Congress had made provision in the present appropriation bill for an additional professor, at $3,000 per year, and for two forecast officials, at $2,000 each, several months before the actual appointments were made, not a single employee made application for or exerted influence to secure one of these desirable places or any of the many promotions that resulted from these appointments. I am confident that the employees of this service realized that the persons best fitted for these important offices would be selected and that personal application was unnecessary.

Such a discipline has proved its beneficence during six years of practise. It has the hearty good will of the employees of the Bureau, and the Secretary of Agriculture and the appropriations committees in Congress have sustained the Chief of Bureau in its enforcement.

STORM-WARNING TOWERS.

Sixty of the new storm-warning towers referred to in my last annual report were installed during the past year, and each was equipped with improved lanterns. In the majority of cases electricity is used as the illuminant. As a result of these improvements the distribution of storm warnings to shipping interests along the seacoasts and on the Great Lakes has been made much more effective. The work of placing these towers and lanterns at all the storm-warning display stations of the service will be prosecuted as fast as available funds will permit, and it is expected that 60 additional stations will be equipped by January 1, 1902.

WEATHER STUDIES IN SCHOOLS.

The increasing attention given to the subject of meteorology in schools and colleges throughout the country has resulted in large demands upon the officials of the Weather Bureau for lectures and other forms of instruction on this subject. Officials of this service have cooperated with educational institutions in this work as far as their official duties would permit.

BAROMETRIC REDUCTIONS.

The revision of the barometric system for the United States, Canada, and the West Indies is practically complete, and the results will soon be published. This work was conducted by Prof. F. H. Bigelow, and included a reexamination of the various elevations, the local and instrumental errors, the reduction of the station pressures to a homogeneous system, and the preparation of normal tables and charts of pressure, temperature, and vapor pressure at sea level, and at the 3,500-foot and 10,000-foot planes.

NORMAL TEMPERATURES BY DECADES FOR 8 A. M. AND 8 P. M., 75TH MERIDIAN TIME.

By ALFRED J. HENRY, Professor of Meteorology.

The normal temperatures which appear in the following table were computed primarily for the use of the Forecast Division of the Central Office and the several district forecast centers. It is believed, however, that officials in charge of Weather Bureau stations and students of meteorological and climatological problems will also find the data helpful.

The normals are based upon the twice-daily telegraphic observations, which have now extended over a period of fourteen years, viz, from 1888 to 1901. The average temperatures for 8 a. m. and 8 p. m., seventy-fifth meridian time, were first computed for each month and plotted on coordinate paper. It was assumed that the mean of the month represented without sensible error, or at least with an error not exceeding 1° F., the mean of the middle of the month. A free-hand curve was drawn through the plotted means, and the figures in the table were scaled from that curve.

Normal temperatures by decades, 8 a. m. and 8 p. m., 75th meridian time.

Stations.	January.						February.						March.						April.					
	1st decade.		2d decade.		3d decade.		1st decade.		2d decade.		3d decade.		1st decade.		2d decade		3d decade.		1st decade.		2d decade.		3d decade.	
	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.
Abilene, Tex	38	48	37	47	37	47	37	49	38	50	50	43	43	57	46	61	49	64	53	67	56	70	59	73
Albany, N. Y	23	37	21	25	20	24	20	24	21	26	23	28	26	31	30	34	34	38	39	43	43	48	48	53
Alpena, Mich	20	28	18	21	17	20	16	20	16	21	17	22	20	24	23	27	27	31	32	36	37	40	41	44
Amarillo, Tex	28	39	27	38	26	38	26	38	27	40	28	43	32	48	35	53	38	57	41	61	45	64	48	67
Atlanta, Ga	39	45	38	45	38	45	38	45	39	47	41	49	43	52	46	55	49	58	52	61	55	64	58	67
Atlantic City, N. J	32	36	31	35	31	34	31	34	31	34	32	35	34	37	37	39	39	42	42	45	45	48	49	51
Augusta, Ga	41	49	40	48	40	48	41	49	42	51	44	53	46	56	48	59	51	61	54	64	67	67	61	69
Baker City, Oreg	22	29	21	28	21	28	22	29	23	31	25	34	27	37	29	41	31	44	33	48	35	51	38	54
Baltimore, Md	32	36	31	34	30	34	30	34	31	34	32	37	35	40	38	43	41	47	45	51	49	55	53	59
Binghamton, N. Y	24	.....	22	.....	21	.....	21	.....	20	.....	22	.....	26	.....	30	.....	34	.....	38	.....	41	.....	45	.....
Bismarck, N. Dak	7	13	4	11	3	11	3	11	4	12	7	16	10	21	15	26	21	34	28	42	35	50	40	55
Block Island, R. I	32	34	31	32	30	31	29	31	29	31	30	32	32	34	34	36	37	39	39	41	42	44	46	46
Boise, Idaho	26	33	24	31	25	32	28	34	30	37	32	42	34	47	36	51	38	54	40	57	42	60	44	62
Boston, Mass	27	31	26	29	25	28	25	28	26	29	27	31	29	33	32	36	36	39	40	43	44	47	48	50
Buffalo, N. Y	26	28	24	26	23	26	23	25	22	25	24	26	26	28	29	32	33	36	38	40	42	44	46	48
Cairo, Ill	33	40	32	39	32	39	32	39	33	41	36	44	39	47	43	50	47	54	50	58	53	62	56	65
Carson City, Nev	26	38	26	38	27	39	28	41	29	43	30	45	32	47	33	49	35	51	37	53	38	56	40	59
Charleston, S. C	46	51	46	50	46	50	47	51	48	52	49	53	51	55	53	57	56	59	59	61	62	63	65	66
Charlotte, N. C	37	44	36	43	36	44	37	44	38	46	40	48	42	50	44	52	47	56	50	59	54	62	58	65
Chattanooga, Tenn	37	44	36	44	37	44	37	45	38	46	40	48	42	51	44	54	47	57	50	60	54	63	57	66
Cheyenne, Wyo	24	28	22	28	22	28	21	28	21	29	22	31	24	33	25	35	27	39	30	43	33	47	37	51
Chicago, Ill	24	27	22	26	21	26	21	27	22	29	23	31	26	34	30	35	34	39	38	43	42	47	46	51
Cincinnati, Ohio	31	36	30	35	30	35	29	35	30	36	31	38	34	41	37	45	40	49	44	54	48	58	51	61
Cleveland, Ohio	27	30	26	28	25	28	24	28	24	28	26	31	28	34	31	37	35	40	40	44	44	48	48	52
Columbus, Ohio	28	32	27	31	26	31	26	31	26	32	28	34	31	37	34	41	38	45	42	50	46	54	50	58
Concordia, Kans	22	31	20	29	20	29	20	30	21	31	23	34	26	38	30	42	35	48	40	54	45	59	49	63
Corpus Christi, Tex	53	58	52	58	52	58	53	59	54	60	56	61	58	63	60	65	63	67	66	69	68	71	70	73
Davenport, Iowa	21	26	19	25	18	24	18	24	20	25	22	28	25	32	29	37	34	43	39	49	45	54	49	59
Denver, Colo	24	35	23	34	23	34	23	34	23	35	24	37	26	40	29	43	32	47	35	51	38	55	41	58
Des Moines, Iowa	19	25	17	23	16	23	16	24	17	25	20	30	24	34	28	39	33	44	38	49	43	54	47	59
Detroit, Mich	24	27	23	26	22	25	21	25	21	26	23	27	26	30	29	34	33	38	38	43	43	48	47	52
Dodge, Kans	24	33	23	32	22	32	22	33	23	35	25	38	27	42	30	46	35	51	40	56	44	60	48	63
Dubuque, Iowa	18	23	16	22	15	22	15	22	16	23	19	26	23	30	27	35	32	40	38	46	43	52	47	57
Duluth, Minn	11	17	9	15	8	14	8	15	9	16	11	19	14	23	19	27	24	31	29	36	34	40	38	44
Eastport, Me	21	24	19	22	18	22	19	23	20	24	22	26	24	28	27	30	30	33	34	36	37	39	40	42
El Paso, Tex	34	51	34	51	35	53	36	55	38	57	40	59	42	61	44	64	46	67	48	70	51	73	54	76
Erie, Pa	27	29	26	28	25	27	24	26	24	26	25	28	27	30	30	33	34	37	39	41	44	46	48	50
Eureka, Cal	44	50	44	50	44	50	44	50	44	50	44	50	44	51	45	51	45	52	46	52	46	52	47	53
Fort Smith, Ark	35	44	34	43	34	44	34	45	35	46	37	48	40	51	43	55	47	59	51	62	55	65	58	68
Fresno, Cal	40	51	40	51	41	53	42	55	43	57	44	59	45	61	46	63	47	65	48	68	49	71	50	74
Galveston, Tex	53	56	52	55	52	55	53	56	54	57	55	58	57	60	59	62	62	64	65	67	67	69	69	71
Grand Haven, Mich	25	27	24	26	23	25	22	24	21	24	23	26	25	29	28	32	32	36	36	41	40	46	44	50
Green Bay, Wis	16	21	14	19	13	18	12	18	12	20	15	22	18	25	22	29	28	34	34	39	39	44	44	49
Harrisburg, Pa	29	33	28	32	27	32	26	33	27	34	28	36	31	38	35	41	39	45	43	49	47	53	51	57
Hatteras, N. C	46	47	45	46	44	46	44	46	45	46	46	47	48	49	50	51	52	53	54	55	57	57	60	60
Havre, Mont	15	20	13	18	11	17	10	17	11	18	13	21	15	25	18	30	22	37	28	44	33	51	37	55
Helena, Mont	19	24	17	22	17	23	18	24	19	25	21	27	23	30	25	34	28	39	32	44	35	48	38	52
Huron, S. Dak	10	18	8	16	7	15	7	16	8	17	11	21	14	23	19	30	25	37	32	45	38	51	42	56
Indianapolis, Ind	28	32	27	31	26	31	26	31	27	32	29	35	31	38	34	42	39	46	44	51	48	55	52	59
Jacksonville, Fla	50	56	49	55	49	56	50	57	51	58	53	59	55	60	57	62	59	64	61	66	64	68	67	70
Jupiter, Fla	62	66	62	65	62	65	63	66	64	66	65	67	66	68	67	69	68	70	69	71	71	72	73	73
Kansas City, Mo	27	34	26	33	25	32	25	32	26	33	28	36	31	40	34	45	39	50	44	55	49	59	53	63
Keokuk, Iowa	23	29	22	27	21	27	21	27	22	29	24	32	28	36	32	40	37	45	42	50	46	54	50	58
Key West, Fla	68	69	67	69	68	69	68	70	69	70	70	71	70	71	71	72	72	72	73	73	74	74	75	75
Knoxville, Tenn	35	42	34	41	34	41	35	42	36	43	38	46	40	49	43	52	46	55	49	58	52	62	55	65
La Crosse, Wis	15	20	13	17	12	17	12	19	13	21	16	24	20	28	24	33	30	39	36	44	41	49	45	53
Lander, Wyo	13	22	12	23	11	24	10	25	12	27	14	30	18	34	22	38	26	42	30	46	33	50	36	54
Lexington, Ky	31	36	30	35	30	35	30	36	31	38	33	41	36	44	39	48	42	52	46	55	50	58	54	61
Little Rock, Ark	38	46	37	45	37	45	37	46	38	47	40	49	42	52	45	55	49	59	53	63	56	66	59	69
Los Angeles, Cal	48	58	47	57	47	57	47	58	48	58	48	59	49	59	49	60	50	60	50	61	51	62	52	62
Louisville, Ky	32	38	31	37	31	37	31	38	32	39	34	41	37	44	40	47	43	51	47	56	51	60	55	64
Lynchburg, Va	33	38	32	37	32	37	33	38	34	39	36	42	38	45	41	48	44	51	47	55	51	59	55	63
Marquette, Mich	18	20	16	18	14	17	13	16	13	17	15	19	17	21	20	24	25	29	31	34	36	38	40	42
Memphis, Tenn	38	45	37	44	37	44	38	45	39	46	41	49	43	52	46	55	49	58	53	62	57	66	60	69
Meridian, Miss	40	49	40	48	41	49	42	50	43	52	44	54	46	56	48	58	51	61	54	64	57	67	60	70
Miles City, Mont	13	22	11	21	10	20	9	20	9	21	11	24	15	28	19	33	24	39	30	46	36	53	41	57
Milwaukee, Wis	21	25	19	23	18	23	18	23	19	24	21	26	24	29	28	32	32	36	36	40	40	44	44	48
Mobile, Ala	46	53	46	52	45	53	45	54	46	55	48	56	50	58	53	60	56	63	59	66	62	69	65	71
Montgomery, Ala	43	52	42	51	43	51	44	52	45	54	46	56	48	58	50	61	52	64	55	67	58	70	61	72
Moorhead, Minn	4	10	2	8	1	7	1	8	2	9	5	13	9	18	15	24	22	32	29	40	34	48	39	53

Normal temperatures by decades, 8 a. m. and 8 p. m.—Continued.

Stations.	January.						February.						March.						April.					
	1st decade.		2d decade.		3d decade.		1st decade.		2d decade.		3d decade.		1st decade.		2d decade.		3d decade.		1st decade.		2d decade.		3d decade.	
	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.
Nantucket, Mass	33	34	32	33	31	32	30	31	30	31	31	32	33	34	35	36	37	38	40	40	43	43	46	46
Nashville, Tenn	36	42	35	41	35	41	35	42	36	43	38	45	40	48	43	51	46	55	49	59	53	63	57	66
New Haven, Conn	26	30	25	29	24	29	24	29	25	30	27	32	29	34	32	36	36	39	40	43	44	46	48	50
New Orleans, La	50	56	50	55	50	56	51	57	52	58	53	59	55	61	57	64	59	66	61	68	63	70	66	72
New York, N. Y	30	34	29	33	28	32	28	32	29	33	30	34	32	36	34	39	38	42	42	46	46	50	50	54
Norfolk, Va	38	43	37	42	37	41	38	41	39	42	40	44	42	46	44	48	47	50	50	53	53	56	56	59
Northfield, Vt	14	19	13	17	12	17	12	18	13	19	15	21	18	24	22	27	27	31	33	36	38	41	43	46
North Platte, Nebr	17	28	16	27	15	26	15	27	16	28	18	31	21	35	25	39	29	44	34	49	39	54	43	58
Oklahoma, Okla	31	41	31	40	30	40	30	41	31	43	33	46	36	49	40	53	44	58	48	62	52	65	55	68
Omaha, Nebr	19	27	17	26	17	25	18	25	19	27	21	30	25	34	29	38	34	44	39	50	44	56	48	60
Oswego, N. Y	23	26	22	25	21	24	21	24	22	25	23	27	25	29	28	31	32	35	36	39	40	43	44	47
Palestine, Tex	43	52	42	51	42	51	43	52	44	54	46	56	48	59	51	62	54	65	57	68	60	70	62	72
Parkersburg, W. Va	30	36	30	35	29	35	29	35	30	36	31	38	34	41	37	44	40	48	44	52	48	56	52	60
Pensacola, Fla	48	55	48	54	49	55	50	56	51	57	53	58	55	60	57	62	59	64	62	66	65	68	68	70
Philadelphia, Pa	31	34	30	33	30	33	29	34	29	35	30	37	33	39	36	42	40	45	44	49	48	53	52	57
Phoenix, Ariz	41	60	42	61	43	62	44	63	45	65	46	67	47	69	48	71	50	73	52	76	54	79	56	82
Pierre, S. Dak	14	23	12	22	10	21	10	21	11	22	13	25	17	29	21	34	27	40	33	47	39	54	44	59
Pittsburg, Pa	31	34	30	33	29	33	29	33	29	34	30	36	32	39	35	42	39	46	43	50	47	54	51	58
Pocatello, Idaho	18	26	17	25	16	25	16	26	17	27	19	30	22	34	25	38	28	42	31	47	34	52	37	56
Port Huron, Mich	23	26	22	25	21	24	20	24	19	25	21	27	24	29	28	32	32	36	36	40	40	44	44	48
Portland, Me	22	25	21	23	21	23	21	24	22	25	24	27	26	29	29	32	33	35	37	39	41	42	45	46
Portland, Oreg	37	41	36	40	36	41	37	43	38	45	39	47	40	49	41	51	42	53	43	55	44	57	45	59
Pueblo, Colo	22	36	21	35	21	35	21	36	22	38	24	41	26	44	29	48	32	52	35	56	39	60	43	63
Raleigh, N. C	37	44	36	43	36	43	37	44	38	45	40	47	42	49	44	52	47	55	50	58	54	61	58	64
Rapid City, S. Dak	20	25	18	24	17	23	17	24	17	25	19	27	21	30	24	33	28	38	33	44	38	50	42	54
Red Bluff, Cal	40	50	40	51	41	52	42	53	43	55	44	57	45	59	46	61	47	63	48	65	50	68	52	71
Rochester, N. Y	25	27	24	26	23	25	22	24	22	24	24	26	27	29	30	32	34	36	38	41	42	46	46	50
Roseburg, Oreg	38	44	38	44	38	45	38	46	38	47	39	49	39	51	40	53	41	55	42	57	43	59	44	61
Sacramento, Cal	41	49	41	49	42	50	43	52	44	54	45	56	46	58	47	60	48	62	49	64	50	66	51	68
St. Louis, Mo	30	36	29	35	28	35	28	35	29	36	32	39	35	42	38	46	42	51	46	56	50	60	54	63
St. Paul, Minn	12	18	10	16	9	16	9	17	10	19	13	22	17	25	21	30	28	37	34	44	39	51	43	55
Salt Lake City, Utah	26	32	25	31	26	32	27	33	29	35	31	38	33	41	35	45	37	49	39	53	42	56	45	59
San Antonio, Tex	46	57	45	56	45	56	46	57	47	59	49	61	51	63	53	66	56	69	59	71	62	73	65	75
San Diego, Cal	49	58	48	57	48	57	49	58	49	58	50	59	51	59	51	60	52	60	53	61	54	61	55	62
Sandusky, Ohio	27	30	26	29	25	28	24	28	25	29	27	31	29	33	32	36	36	40	40	44	45	48	49	52
San Francisco, Cal	47	52	46	52	46	53	47	53	47	54	48	54	48	55	49	55	49	56	50	56	50	56	51	57
Santa Fe, N. Mex	24	32	23	31	23	32	24	34	25	36	27	39	29	42	31	45	33	48	36	51	39	54	42	57
Sault Ste. Marie, Mich	15	19	12	17	11	16	10	16	9	17	11	19	13	21	17	24	22	29	28	34	34	39	38	43
Savannah, Ga	45	51	45	51	46	51	47	52	48	53	49	54	51	56	53	58	55	60	58	62	61	65	64	68
Seattle, Wash	40	42	39	42	39	43	39	44	40	45	40	46	41	47	41	48	42	50	43	52	44	54	45	56
Shreveport, La	43	52	42	51	42	51	43	52	44	53	46	55	48	58	50	61	53	64	56	67	59	70	62	73
Sioux City, Iowa	17	.....	15	.....	14	.....	13	.....	14	.....	17	.....	20	.....	24	.....	30	.....	36	.....	42	.....	46	.....
Spokane, Wash	25	30	24	29	25	31	26	33	27	36	28	39	30	42	32	45	34	48	36	51	38	54	41	57
Springfield, Ill	25	30	24	29	23	29	23	30	24	31	27	33	30	37	34	41	38	46	42	51	46	55	50	59
Springfield, Mo	29	36	28	35	28	34	28	35	29	37	31	40	34	43	38	47	42	51	46	55	50	59	53	62
Tacoma, Wash	39	.....	38	.....	38	.....	38	.....	39	.....	39	.....	40	.....	40	.....	41	.....	41	.....	42	.....	43	.....
Tampa, Fla	55	59	54	59	55	60	56	61	57	62	58	63	59	64	61	65	63	66	65	68	67	70	69	72
Toledo, Ohio	25	29	24	28	23	27	22	27	22	28	24	29	27	32	30	36	35	41	40	46	44	50	48	54
Valentine, Nebr	15	25	18	23	13	22	14	21	15	23	18	27	22	33	26	39	32	44	38	49	44	53	48	56
Vicksburg, Miss	44	52	43	51	43	51	44	52	45	54	47	56	49	58	51	61	54	64	57	67	60	70	63	72
Walla Walla, Wash	32	35	31	34	31	36	32	38	34	40	35	43	37	46	39	50	41	54	43	57	45	60	47	63
Washington, D. C	31	36	30	35	29	34	29	34	31	36	33	38	35	41	38	44	41	48	45	52	49	56	53	59
Wichita, Kans	27	36	26	35	25	35	25	35	26	37	28	40	31	44	35	48	40	53	45	58	49	62	53	65
Williston, N. Dak	6	12	4	10	3	9	2	10	3	12	6	15	10	20	15	25	21	33	27	41	32	49	37	54
Wilmington, N. C	42	48	41	47	41	47	42	48	43	49	45	50	47	52	49	54	51	56	54	58	57	60	60	63
Winnemucca, Nev	22	33	21	32	22	34	23	36	25	38	27	41	29	44	31	47	33	50	35	53	37	56	39	59
Yankton, S. Dak	16	.....	14	.....	13	.....	13	.....	14	.....	17	.....	20	.....	23	.....	29	.....	35	.....	39	.....	43	.....
Yuma, Ariz	46	62	46	62	47	64	48	66	49	68	50	70	51	72	52	74	53	76	55	79	57	82	59	85
Canadian stations.																								
St. Johns, N. F	26	26	25	24	24	23	23	23	24	24	26	25	28	26	30	28	32	30	34	32	36	34	38	36
Sydney, C. B. I	24	24	22	22	21	21	20	21	21	22	23	24	25	26	28	28	31	30	34	32	37	35	41	38
Halifax, N. S	24	26	23	25	22	24	22	24	23	25	25	26	27	28	30	30	33	32	36	35	39	38	42	41
Chatham, N. B	10	14	8	13	7	12	8	13	10	15	14	18	18	21	22	24	26	28	31	32	36	36	41	40
Father Point, Que	10	12	7	10	7	10	9	11	11	13	14	16	17	19	21	22	25	26	30	30	34	34	38	38
Quebec, Que	10	14	9	12	8	12	9	13	10	15	13	18	16	21	20	24	24	28	29	33	34	38	39	43
Montreal, Que	13	15	12	13	11	13	12	14	13	16	16	19	19	23	23	27	28	32	34	37	39	42	44	47
Bissett, Ont	6	12	4	10	2	10	2	11	4	13	6	16	10	19	15	23	22	28	29	34	35	40	40	45
White River, Ont	−1	6	−3	3	−5	3	−6	4	−7	6	−5	10	−2	14	3	19	11	25	19	32	27	38	32	43
Saugeen, Ont	23	24	21	22	20	21	19	20	18	20	19	22	21	24	24	27	28	30	33	34	39	38	43	42
Parry Sound, Ont	15	19	13	18	12	17	11	17	10	18	12	20	14	22	18	25	24	30	30	35	36	40	41	45
Port Arthur, Ont	6	12	3	11	2	10	1	10	1	12	4	15	8	18	12	22	18	27	26	32	32	37	36	41
Winnipeg, Man	−3	2	−5	−1	−7	−2	−7	−1	−5	2	−3	6	1	11	6	17	15	26	24	35	32	42	37	48
Minnedosa, Man	−2	2	−5	−1	−6	−1	−7	0	−7	1	−4	6	0	11	5	16	14	25	23	34	30	42	35	47
Qu'Appelle, Assin	2	5	−1	2	−2	1	−3	1	−3	3	−1	6	3	11	7	16	14	25	22	34	29	43	34	49
Medicine Hat, Assin	11	15	9	14	8	13	7	13	8	15	10	19	13	23	17	28	22	36	29	44	34	50	39	54
Swift Current, Assin	7	11	5	9	4	8	3	9	4	11	6	13	10	17	14	22	20	30	26	38	31	46	35	51
Calgary, Alberta	11	16	10	14	9	14	8	15	8	16	10	20	13	24	16	29	20	34	24	40	29	46	33	50
Edmonton, Alberta	6	14	4	12	3	11	3	12	5	14	7	18	10	23	14	28	20	34	26	41	31	47	35	51
Prince Albert, Sask	−5	0	−8	−2	−9	−2	−8	1	−7	4	−4	8	−1	13	3	19	10	26	19	35	27	44	32	49
Battleford, Sask	−2	3	−5	1	−6	−1	−5	1	−3	4	−1	8	2	12	7	17	14	25	21	34	28	43	34	50

Normal temperatures by decades, 8 a. m. and 8 p. m.—Continued.

Stations.	May.						June.						July.						August.					
	1st decade.		2d decade.		3d decade.		1st decade.		2d decade.		3d decade.		1st decade.		2d decade.		3d decade.		1st decade.		2d decade.		3d decade.	
	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.
Abilene, Tex	62	76	64	78	66	80	69	82	71	85	72	87	73	88	74	89	74	89	73	88	72	87	71	85
Albany, N. Y	52	57	56	61	60	64	63	67	66	70	68	72	69	73	69	74	69	74	68	73	67	72	65	69
Alpena, Mich	45	48	49	51	53	55	57	59	60	62	62	65	63	66	64	67	64	67	63	67	61	65	59	63
Amarillo, Tex	51	69	55	72	58	75	61	77	63	79	65	81	67	82	67	82	67	82	67	82	65	81	63	79
Atlanta, Ga	61	70	64	72	67	74	69	76	71	78	73	79	74	79	74	80	74	79	73	79	72	78	71	77
Atlantic City, N. J	53	53	56	56	60	59	63	62	65	64	67	67	69	69	71	71	72	72	72	72	71	72	70	71
Augusta, Ga	64	72	67	75	70	77	73	78	75	79	76	80	76	81	76	81	76	81	76	80	75	79	73	78
Baker City, Oreg	40	57	42	60	43	63	45	66	47	68	49	71	51	74	52	77	53	78	53	79	52	79	51	78
Baltimore, Md	57	62	61	65	64	68	68	71	71	74	73	76	74	77	75	78	75	78	74	77	73	76	71	74
Binghamton, N. Y	49	.....	53	.....	57	.....	60	.....	63	.....	66	.....	68	.....	68	.....	67	.....	66	.....	64	.....	61	.....
Bismarck, N. Dak	44	59	47	62	50	65	54	68	57	71	59	73	61	76	62	77	61	77	59	77	57	75	54	72
Block Island, R. I	49	49	52	52	55	55	59	59	62	61	64	63	66	65	68	67	68	68	68	68	68	68	67	67
Boise, Idaho	46	64	48	67	50	70	52	73	54	76	55	80	56	85	57	88	58	88	58	86	57	84	55	81
Boston, Mass	52	54	55	57	59	60	62	63	65	66	67	69	69	70	70	71	69	71	68	70	67	69	65	68
Buffalo, N. Y	49	52	53	55	57	59	60	63	64	66	66	69	68	71	69	72	68	72	68	71	67	70	65	69
Cairo, Ill	59	68	62	71	65	74	68	76	70	78	72	80	73	81	74	81	73	81	73	80	72	79	70	77
Carson City, Nev	42	61	44	63	46	66	47	69	49	72	51	74	53	77	55	80	55	81	55	80	54	79	52	77
Charleston, S. C	68	69	71	72	73	74	75	76	77	78	78	79	79	80	79	80	79	80	79	80	78	80	76	79
Charlotte, N. C	61	68	64	70	67	72	70	74	72	76	73	77	74	77	74	77	73	77	72	77	71	77	70	76
Chattanooga, Tenn	60	69	63	72	66	74	68	76	70	78	72	79	73	79	73	80	73	80	72	79	71	78	70	77
Cheyenne, Wyo	40	54	43	57	46	61	49	64	52	68	54	70	56	72	58	74	58	74	57	73	55	72	53	70
Chicago, Ill	50	54	54	57	58	60	62	64	65	67	67	70	69	72	70	74	69	74	68	73	67	72	65	71
Cincinnati, Ohio	55	64	59	67	63	70	66	73	69	76	70	78	71	80	72	81	71	80	70	79	69	78	67	77
Cleveland, Ohio	52	56	56	60	59	64	62	67	65	70	67	72	69	74	70	75	69	75	68	74	67	73	65	71
Columbus, Ohio	54	61	57	64	60	67	63	70	66	73	68	75	69	77	70	78	69	78	68	77	67	76	65	74
Concordia, Kans	53	67	57	70	60	73	63	76	66	79	68	81	69	83	70	84	69	84	68	83	67	81	65	79
Corpus Christi, Tex	72	75	74	77	76	79	77	81	78	82	79	83	80	84	80	84	80	84	80	84	79	83	78	83
Davenport, Iowa	58	63	56	66	59	69	62	72	65	75	67	77	69	79	70	80	69	79	68	78	66	77	64	75
Denver, Col	44	61	47	64	50	67	53	70	56	73	58	76	60	78	61	79	61	79	60	78	58	77	56	76
Des Moines, Iowa	51	63	55	66	58	69	61	72	64	75	66	77	68	79	69	81	68	80	67	79	65	77	63	75
Detroit, Mich	51	56	55	60	58	63	61	66	64	69	66	71	68	73	69	74	68	74	67	73	66	72	64	70
Dodge, Kans	52	66	56	69	59	72	62	75	64	78	66	80	68	82	69	84	68	84	67	83	66	81	64	79
Dubuque, Iowa	51	61	54	65	58	69	62	72	65	75	67	77	68	79	69	80	68	79	67	78	65	76	63	74
Duluth, Minn	42	48	45	51	48	54	51	57	54	60	57	63	60	65	62	67	62	68	61	68	60	67	58	65
Eastport, Me	43	44	46	46	49	49	52	52	54	54	56	56	58	58	59	59	60	59	60	60	59	60	58	59
El Paso, Tex	57	79	60	82	63	85	65	87	67	88	69	89	70	89	71	88	71	88	70	87	69	86	67	85
Erie, Pa	52	54	56	58	60	61	63	64	65	67	67	69	69	71	70	72	70	72	69	71	68	70	66	69
Eureka, Cal	48	53	49	54	50	55	50	56	51	56	52	57	52	57	53	58	53	58	53	58	53	58	53	58
Fort Smith, Ark	61	71	64	74	67	77	70	79	72	81	73	83	74	84	75	85	75	85	74	84	73	83	71	82
Fresno, Cal	52	77	54	80	56	83	58	86	60	89	62	92	64	95	65	97	66	98	66	97	65	96	64	94
Galveston, Tex	71	73	73	75	75	77	77	79	79	80	80	81	81	82	81	83	81	83	81	83	80	83	79	82
Grand Haven, Mich	48	54	52	57	56	60	59	63	62	66	64	68	66	70	67	71	66	71	65	71	64	70	62	68
Green Bay, Wis	48	54	52	58	56	62	59	66	61	69	63	71	65	72	66	73	65	73	64	72	63	71	61	68
Harrisburg, Pa	55	61	59	64	62	67	65	70	68	72	69	73	70	74	71	75	71	75	70	74	69	73	67	71
Hatteras, N. C	63	63	67	66	70	69	73	71	75	73	76	75	77	76	78	77	78	77	78	77	78	77	77	76
Havre, Mont	41	59	45	62	48	65	50	68	52	71	54	74	56	76	57	78	56	79	55	79	53	78	50	74
Helena, Mont	41	56	44	59	47	62	49	65	51	68	53	71	55	74	57	76	57	76	56	75	55	74	53	71
Huron, S. Dak	46	60	50	64	54	67	57	70	60	73	62	76	63	78	64	80	63	79	62	78	60	76	57	74
Indianapolis, Ind	56	63	59	66	62	69	65	72	67	75	69	78	71	79	71	80	70	80	69	79	68	78	66	76
Jacksonville, Fla	69	72	71	74	73	76	75	77	77	78	78	79	79	79	79	80	79	80	78	79	78	79	77	78
Jupiter, Fla	73	74	77	75	78	76	79	77	80	78	80	79	81	79	81	80	81	80	82	80	82	80	81	80
Kansas City, Mo	56	66	59	69	62	72	65	75	68	78	70	80	71	82	72	83	71	82	70	81	69	80	67	78
Keokuk, Iowa	54	62	58	66	62	70	65	73	68	76	69	78	70	80	71	81	71	81	70	80	68	78	66	76
Key West, Fla	76	77	78	78	80	79	81	80	82	81	82	82	82	82	83	82	83	83	83	83	83	83	82	82
Knoxville, Tenn	58	68	61	70	64	72	67	74	69	76	71	77	72	78	72	78	72	78	71	78	70	77	68	76
La Crosse, Wis	49	57	53	61	57	65	60	69	63	72	65	74	66	76	67	77	66	76	65	75	63	73	61	71
Lander, Wyo	39	58	42	62	45	65	48	68	50	71	52	74	53	76	54	78	54	78	53	77	51	76	49	73
Lexington, Ky	57	64	60	67	63	70	66	72	69	74	71	76	72	76	73	76	72	76	72	76	71	75	69	74
Little Rock, Ark	62	72	65	74	68	76	70	78	72	80	73	81	74	82	75	83	75	83	74	83	73	82	71	81
Los Angeles, Cal	53	63	54	64	55	65	56	67	57	69	58	70	59	71	60	72	61	73	62	73	62	73	62	72
Louisville, Ky	58	67	61	70	64	73	67	76	69	78	71	80	72	81	73	81	72	81	71	80	70	79	68	78
Lynchburg, Va	59	66	62	69	65	71	68	73	70	75	71	76	72	77	73	77	73	77	72	76	71	76	69	74
Marquette, Mich	44	46	48	50	52	54	55	58	58	61	61	63	63	65	65	66	65	66	64	65	62	64	60	63
Memphis, Tenn	63	72	66	74	69	76	71	78	73	80	74	81	75	82	76	83	75	83	74	82	73	81	71	80
Meridian, Miss	63	72	66	74	69	76	71	77	73	78	74	79	75	79	75	79	74	79	74	79	73	78	71	77
Miles City, Mont	45	61	48	65	51	68	54	71	57	74	60	77	61	80	62	82	62	83	61	83	59	81	56	78
Milwaukee, Wis	48	52	52	56	56	59	59	62	62	65	65	68	67	70	68	72	68	72	67	72	66	71	64	69
Mobile, Ala	68	73	70	75	72	77	74	78	76	79	77	80	78	81	78	81	78	81	77	80	76	80	75	79
Montgomery, Ala	64	74	67	76	70	78	72	80	74	81	75	81	76	82	76	82	76	82	75	81	75	81	74	80
Moorhead, Minn	44	57	48	61	52	64	55	67	58	70	60	72	61	74	62	75	61	74	60	73	58	72	55	69
Nantucket, Mass	50	49	54	52	57	55	60	57	63	59	65	61	67	63	68	65	68	66	69	66	69	66	68	65
Nashville, Tenn	60	69	63	72	66	75	69	77	71	79	72	80	73	81	74	82	73	82	72	81	71	80	69	79
New Haven, Conn	52	54	56	58	60	61	63	64	66	67	68	70	69	72	70	74	70	73	69	72	68	70	66	69
New Orleans, La	69	74	71	76	73	78	75	79	77	80	78	81	79	81	79	82	79	82	78	81	78	81	77	80
New York, N. Y	53	57	56	60	59	63	62	66	65	69	67	71	69	73	70	74	70	74	70	74	69	73	68	72
Norfolk, Va	60	62	64	65	67	68	70	71	72	73	74	75	75	76	76	77	76	77	75	76	74	76	73	75
Northfield, Vt	48	51	52	55	56	58	59	61	61	64	63	65	65	66	66	67	65	66	64	65	62	64	59	62
North Platte, Nebr	47	62	51	65	54	68	57	71	60	74	62	77	64	79	65	81	64	81	63	80	61	79	59	76
Oklahoma, Okla	58	71	61	74	64	76	67	78	69	80	71	82	72	83	72	84	72	84	71	84	70	83	68	82
Omaha, Nebr	52	64	56	67	59	70	62	73	65	76	67	79	69	81	70	82	69	81	68	80	66	79	64	76
Oswego, N. Y	48	51	52	55	56	59	60	62	63	65	65	67	67	69	68	70	68	70	67	69	66	68	64	66
Palestine, Tex	64	74	66	76	68	78	70	80	72	82	73	83	74	84	75	85	75	85	74	85	73	84	72	83
Parkersburg, W. Va	56	63	60	66	63	69	66	72	68	74	69	75	70	76	71	77	70	77	69	76	68	75	66	73
Pensacola, Fla	70	72	72	74	74	76	76	78	78	79	79	80	79	80	80	81	80	81	79	81	79	81	78	80
Philadelphia, Pa	56	60	60	63	63	66	66	69	69	72	71	74	72	75	73	76	73	76	72	76	71	75	70	73

Normal temperatures by decades, 8 a. m. and 8 p. m.—Continued.

Stations.	May.						June.						July.						August.					
	1st decade.		2d decade.		3d decade.		1st decade.		2d decade.		3d decade.		1st decade.		2d decade.		3d decade.		1st decade.		2d decade.		3d decade.	
	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.
Phoenix, Ariz.	58	85	61	88	64	91	67	94	70	97	74	99	77	100	79	101	79	101	78	100	77	99	75	98
Pierre, S. Dak.	48	63	52	67	55	70	58	73	61	76	63	79	65	81	66	83	66	83	65	82	63	81	60	78
Pittsburg, Pa.	55	62	58	65	61	68	64	71	66	73	68	75	69	76	70	77	70	77	69	76	68	75	66	74
Pocatello, Idaho	40	60	43	64	45	68	47	71	49	74	51	77	53	80	55	83	55	83	54	82	52	80	50	78
Port Huron, Mich.	48	52	52	56	56	59	60	62	63	65	65	68	66	70	67	71	67	71	66	70	64	69	62	67
Portland, Me.	49	50	53	53	56	56	59	59	62	62	64	64	66	66	67	67	67	67	66	67	65	66	63	64
Portland, Oreg.	47	61	49	63	51	65	52	67	53	69	54	71	55	73	56	75	57	76	58	76	58	75	57	73
Pueblo, Colo.	46	66	49	69	52	72	55	75	58	77	60	79	62	80	63	81	63	81	62	81	60	80	58	78
Raleigh, N. C.	61	67	64	70	67	72	69	74	71	76	73	77	74	77	75	78	75	78	74	77	73	77	72	76
Rapid City, S. Dak.	46	58	49	62	52	65	55	68	58	71	61	74	63	77	64	79	64	79	63	78	61	77	59	74
Red Bluff, Cal.	54	74	56	77	58	80	60	83	62	86	64	89	66	92	68	95	68	96	68	95	67	94	66	92
Rochester, N. Y.	50	54	54	58	58	62	62	65	65	68	67	70	68	71	69	72	68	72	67	71	66	70	64	68
Roseburg, Oreg.	46	63	47	65	48	67	49	69	50	72	51	75	52	77	53	79	54	80	54	80	53	79	53	77
Sacramento, Cal.	52	70	53	72	54	74	55	76	57	79	58	82	59	84	59	85	59	86	59	86	59	85	59	84
St. Louis, Mo.	58	66	62	69	65	72	68	75	71	78	72	80	73	81	74	82	73	82	72	81	71	80	69	79
St. Paul, Minn.	47	59	51	63	55	66	58	69	61	72	63	75	65	77	66	78	65	78	64	77	62	75	60	72
Salt Lake City, Utah.	48	62	51	65	54	69	57	72	59	75	61	78	63	81	65	84	66	85	66	84	65	83	63	80
San Antonio, Tex.	67	77	69	79	71	81	73	83	74	85	75	86	75	87	76	88	76	88	75	88	74	87	73	86
San Diego, Cal.	56	62	57	63	58	64	59	65	60	66	61	67	62	68	63	69	64	70	65	71	65	71	65	71
Sandusky, Ohio.	53	56	57	60	61	64	64	68	67	71	69	73	70	74	71	75	71	75	70	74	68	73	66	71
San Francisco, Cal.	51	57	52	58	52	58	52	58	53	59	53	59	53	60	54	60	54	60	54	61	55	61	55	61
Santa Fe, N. Mex.	45	60	48	63	51	66	54	69	56	71	58	72	60	73	61	73	61	73	60	73	58	72	56	71
Sault Ste. Marie, Mich.	42	47	46	51	50	55	53	58	55	60	57	62	59	63	60	64	60	64	59	64	58	63	56	61
Savannah, Ga.	67	70	70	72	72	74	74	76	76	77	77	78	78	79	78	79	78	79	78	79	77	78	76	77
Seattle, Wash.	46	58	48	60	50	62	51	64	52	66	53	68	54	70	55	72	56	72	56	71	56	70	55	68
Shreveport, La.	65	75	68	77	70	79	72	81	74	82	75	83	76	84	76	85	76	85	75	84	74	83	73	82
Sioux City, Iowa.	50	.....	54	.....	57	.....	60	.....	63	.....	65	.....	67	.....	68	.....	67	.....	66	.....	64	.....	61	.....
Spokane, Wash.	44	60	46	63	48	66	50	69	52	72	54	75	55	78	56	80	56	81	56	81	55	79	53	76
Springfield, Ill.	54	63	58	67	61	70	64	73	66	75	68	77	70	79	71	80	70	80	69	79	67	78	65	76
Springfield, Mo.	56	65	59	68	62	71	65	74	67	76	69	78	70	79	71	80	71	80	70	79	69	78	67	76
Tacoma, Wash.	45	.....	47	.....	48	.....	49	.....	50	.....	51	.....	52	.....	53	.....	54	.....	55	.....	55	.....	54	.....
Tampa, Fla.	71	74	73	75	75	76	77	77	78	78	79	79	79	79	80	80	80	80	79	79	79	79	78	78
Toledo, Ohio.	52	58	56	62	60	65	63	68	66	71	67	73	68	75	69	76	69	76	68	75	66	73	64	71
Valentine, Nebr.	51	59	54	62	56	65	58	68	60	71	62	74	64	77	65	79	64	80	63	79	61	78	58	75
Vicksburg, Miss.	66	74	68	76	70	78	72	79	73	80	74	81	75	81	76	82	76	82	75	81	74	81	73	80
Walla Walla, Wash.	49	66	51	69	53	72	55	75	57	78	59	81	61	83	62	85	63	86	63	85	62	83	60	80
Washington, D. C.	57	62	60	65	63	68	66	71	69	73	71	74	72	75	73	76	73	76	73	76	72	75	70	73
Wichita, Kans.	56	68	59	71	62	74	65	77	68	79	70	81	71	83	72	84	72	83	71	82	69	81	67	79
Williston, N. Dak.	42	58	46	61	50	64	53	67	56	70	58	73	59	76	60	78	59	77	58	76	56	74	53	71
Wilmington, N. C.	63	66	66	69	69	71	72	73	74	75	76	76	77	77	78	78	78	78	77	77	76	77	75	76
Winnemucca, Nev.	42	62	45	65	48	68	50	71	52	74	54	78	56	82	58	85	58	86	57	85	55	84	53	81
Yankton, S. Dak.	47	.....	51	.....	55	.....	59	.....	63	.....	65	.....	67	.....	68	.....	67	.....	66	.....	64	.....	62	.....
Yuma, Ariz.	61	88	63	90	65	92	67	94	70	96	73	98	76	100	78	102	79	102	79	101	78	100	76	99
Canadian stations.																								
St. Johns, N. F.	41	38	44	40	47	42	50	44	53	47	56	50	59	53	61	55	62	57	62	57	61	56	60	55
Sydney, C. B. I.	45	41	48	44	51	47	54	50	57	53	60	56	62	58	64	60	65	61	65	61	64	60	63	59
Halifax, N. S.	45	44	49	47	53	50	56	53	58	55	60	57	62	59	64	61	65	62	65	62	64	61	63	60
Chatham, N. B.	45	44	49	48	53	52	56	56	59	59	61	62	63	64	65	66	64	65	63	64	62	63	60	60
Father Point, Que.	42	42	45	45	48	48	51	51	54	53	56	55	57	57	58	58	57	57	56	56	55	55	54	53
Quebec, Que.	44	48	48	53	52	56	55	59	58	62	60	64	62	66	63	67	62	66	61	65	60	64	57	61
Montreal, Que.	48	52	52	55	56	58	60	61	63	64	65	66	66	68	67	69	66	68	65	67	64	66	62	64
Bissett, Ont.	45	50	49	54	53	57	56	60	59	63	61	64	62	65	62	66	61	65	60	64	58	62	56	60
White River, Ont.	37	47	42	51	46	55	50	59	53	63	54	64	55	65	56	66	55	65	54	64	52	62	50	59
Saugeen, Ont.	47	46	51	50	55	54	58	58	61	61	63	63	64	65	65	66	65	66	64	65	63	64	61	63
Parry Sound, Ont.	45	49	49	53	53	57	56	60	59	63	61	65	63	67	64	68	64	68	63	67	62	65	60	63
Port Arthur, Ont.	40	45	44	49	48	53	51	56	54	59	56	61	58	63	60	65	59	65	58	64	56	63	54	60
Winnipeg, Man.	41	52	45	56	49	60	53	64	56	67	59	69	60	71	61	72	59	71	57	70	55	68	52	64
Minnedosa, Man.	39	52	43	56	47	59	50	62	53	65	55	67	57	69	58	70	56	70	54	69	52	67	49	63
Qu'Appelle, Assin.	39	54	43	58	46	61	49	63	52	65	53	66	55	67	56	68	55	68	54	67	52	66	49	64
Medicine Hat, Assin.	43	58	46	61	49	64	52	67	54	70	56	73	57	76	58	78	57	77	56	76	54	74	51	70
Swift Current, Assin.	39	55	43	59	46	62	49	65	52	68	54	70	55	72	56	74	55	75	54	74	52	71	49	67
Calgary, Alberta.	36	54	39	57	42	59	44	61	46	63	48	65	49	67	50	69	49	69	48	68	47	67	45	65
Edmonton, Alberta.	39	55	42	59	44	61	46	63	48	65	50	67	51	68	52	69	52	68	51	67	50	65	47	63
Prince Albert, Sask.	37	53	41	57	44	60	47	62	50	64	52	66	54	68	55	70	54	69	52	68	50	65	47	62
Battleford, Sask.	39	55	44	60	47	63	50	65	52	67	54	69	55	71	56	72	55	71	53	70	51	69	48	66

Normal temperatures by decades, 8 a. m. and 8 p. m.—Continued.

Stations.	September.						October.						November.						December.					
	1st decade.		2d decade.		3d decade.		1st decade.		2d decade.		3d decade.		1st decade		2d decade		3d decade.		1st decade.		2d decade.		3d decade.	
	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.
Abilene, Tex	89	82	66	79	63	76	60	73	57	69	53	65	49	61	45	57	43	54	51	50	40	50	39	49
Albany, N. Y	63	67	60	64	56	60	51	56	47	52	43	48	40	43	37	40	33	37	30	33	27	30	24	28
Alpena, Mich	57	61	55	59	51	55	47	51	44	47	40	43	37	39	33	36	30	33	27	30	25	27	23	25
Amarillo, Tex	61	77	59	74	55	70	51	66	47	61	44	57	40	53	37	50	34	46	32	43	30	41	29	40
Atlanta, Ga	69	75	67	73	63	70	60	67	56	64	52	61	49	57	46	54	44	51	42	49	41	47	40	46
Atlantic City, N. J	68	69	66	67	63	64	59	61	55	57	51	53	48	49	44	46	41	43	38	40	36	38	34	37
Augusta, Ga	71	77	69	75	66	72	61	69	57	65	54	62	50	59	47	56	45	54	43	52	42	51	41	50
Baker City, Oreg	48	74	45	70	42	66	40	62	38	58	36	54	33	50	31	45	29	40	27	37	25	33	23	31
Baltimore, Md	69	72	65	69	62	65	58	61	54	57	50	54	46	50	43	47	40	44	37	41	35	39	33	37
Binghamton, N. Y	59	.....	56	.....	53	.....	50	.....	45	.....	42	.....	38	.....	35	.....	32	.....	28	.....	26	.....	25	.....
Bismarck, N. Dak	51	69	48	65	44	59	40	54	35	48	30	42	26	35	22	29	19	25	16	22	13	19	10	16
Block Island, R. I	65	65	63	64	60	60	57	57	53	54	50	51	47	48	44	45	41	42	38	39	36	37	34	35
Boise, Idaho	53	77	51	73	48	69	46	65	44	60	42	55	39	50	36	45	34	42	32	39	30	36	28	34
Boston, Mass	63	65	61	63	58	59	54	56	50	52	46	49	43	46	40	42	37	40	34	37	31	34	29	32
Buffalo, N. Y	63	66	60	63	57	60	53	56	49	52	46	48	42	44	38	40	35	37	32	34	30	32	28	30
Cairo, Ill	68	75	64	73	60	69	56	63	52	61	48	57	45	53	42	49	40	46	38	44	36	42	34	40
Carson City, Nev	50	74	48	71	45	67	42	63	39	59	37	56	35	53	33	50	31	46	29	42	28	39	27	38
Charleston, S. C	74	78	72	76	69	74	66	70	63	66	60	64	57	61	54	59	51	56	49	54	47	52	46	51
Charlotte, N. C	68	74	66	72	62	69	58	66	54	63	50	59	47	55	44	52	42	50	40	48	38	46	37	45
Chattanooga, Tenn	68	75	65	73	61	70	57	67	53	63	50	60	47	56	44	52	41	50	39	48	38	46	37	44
Cheyenne, Wyo	50	68	47	65	44	60	40	54	37	49	35	45	32	41	30	37	28	34	27	32	26	30	25	29
Chicago, Ill	63	69	60	67	57	63	53	59	49	54	44	49	39	44	35	40	31	37	28	34	26	31	25	29
Cincinnati, Ohio	65	75	62	72	58	69	54	64	50	60	46	55	42	50	40	46	37	42	35	40	33	38	32	37
Cleveland, Ohio	62	69	59	66	56	62	54	58	50	54	46	50	42	46	39	42	36	39	33	36	30	33	28	31
Columbus, Ohio	63	71	60	68	56	65	52	61	48	56	44	51	41	47	38	43	35	40	32	37	30	35	29	34
Concordia, Kans	62	76	59	72	55	68	51	63	46	58	41	53	37	48	33	43	30	39	28	36	26	34	24	32
Corpus Christi, Tex	77	82	75	81	73	80	71	78	69	76	66	73	63	70	60	67	58	64	56	62	54	60	53	59
Davenport, Iowa	61	72	58	68	54	64	50	60	46	55	41	49	37	44	33	39	30	35	27	32	25	30	23	28
Denver, Colo	53	74	50	71	47	67	44	63	40	58	37	53	34	48	31	44	29	41	28	38	27	36	26	35
Des Moines, Iowa	60	72	57	68	53	64	49	60	45	55	40	50	35	45	31	40	28	36	25	33	23	30	21	27
Detroit, Mich	62	68	59	65	55	61	51	57	47	52	43	48	39	44	36	40	33	37	30	34	28	31	26	29
Dodge, Kans	61	76	58	72	54	68	50	64	45	59	40	54	36	49	32	45	30	41	28	38	26	36	26	34
Dubuque, Iowa	60	71	57	67	53	63	49	59	45	54	40	48	36	43	32	38	29	34	26	31	23	28	20	25
Duluth, Minn	56	62	53	59	50	55	46	51	42	47	37	42	32	36	27	31	23	27	19	24	16	21	13	19
Eastport, Me	57	57	55	55	52	53	49	50	46	47	43	44	40	41	36	38	32	34	29	31	26	28	23	26
El Paso, Tex	65	83	62	80	59	77	56	74	52	70	48	66	44	62	41	59	39	56	37	54	36	52	35	51
Erie, Pa	64	67	61	64	58	61	54	57	50	53	46	49	43	45	40	42	37	39	34	36	31	33	29	31
Eureka, Cal	52	58	52	56	51	57	51	57	50	56	49	55	49	55	48	54	47	53	46	52	45	51	44	51
Fort Smith, Ark	68	80	65	77	61	74	57	70	53	66	49	62	46	58	43	54	41	51	39	49	37	47	36	45
Fresno, Cal	62	91	60	87	58	83	56	79	53	75	50	71	48	67	46	63	44	59	43	55	42	52	41	51
Galveston, Tex	78	81	77	80	75	78	73	76	70	73	67	70	64	67	61	64	59	62	57	60	55	58	54	57
Grand Haven, Mich	60	66	57	63	54	59	50	55	46	51	42	47	39	43	35	39	33	36	31	33	29	31	27	29
Green Bay, Wis	58	65	55	62	52	58	48	54	44	49	39	44	34	39	30	35	27	31	24	28	21	25	18	23
Harrisburg, Pa	65	69	62	66	58	62	54	58	50	54	46	51	42	47	39	44	36	41	33	38	31	36	30	34
Hatteras, N. C	76	75	74	73	71	71	68	68	64	64	61	61	58	58	55	55	52	53	49	51	47	49	45	48
Havre, Mont	47	70	44	65	41	60	38	54	35	49	32	43	28	38	25	33	24	30	21	27	19	24	17	22
Helena, Mont	50	67	47	63	44	59	41	54	38	49	35	44	32	40	29	36	27	33	25	30	23	28	21	26
Huron, S. Dak	54	71	50	67	46	63	42	58	38	53	34	46	29	39	25	33	21	29	18	25	15	22	12	20
Indianapolis, Ind	64	73	61	70	57	66	52	62	48	58	44	54	40	48	37	44	35	40	33	37	31	35	29	33
Jacksonville, Fla	76	77	75	76	72	74	69	72	66	70	63	67	60	64	57	62	55	60	53	58	52	57	51	56
Jupiter, Fla	81	80	80	79	79	78	77	77	75	76	73	75	71	73	70	72	68	70	66	68	64	67	63	66
Kansas City, Mo	64	76	61	73	58	70	54	66	50	62	46	56	42	50	38	45	35	42	32	39	30	37	28	35
Keokuk, Iowa	63	73	60	70	56	66	52	62	48	58	44	52	39	46	35	42	32	39	29	36	27	33	25	31
Key West, Fla	82	82	82	81	81	81	80	80	79	78	77	77	75	76	73	74	71	73	70	71	69	70	68	70
Knoxville, Tenn	66	74	63	72	59	69	55	65	51	61	47	57	44	53	41	50	39	47	37	45	36	43	35	42
La Crosse, Wis	58	69	55	66	51	61	47	56	43	51	38	45	33	40	29	36	26	32	23	29	20	26	17	23
Lander, Wyo	46	70	42	66	38	60	35	54	32	48	29	43	26	38	23	34	20	30	17	27	15	24	14	23
Lexington, Ky	67	72	63	69	59	66	55	62	51	58	47	54	44	50	41	47	38	44	35	42	33	40	32	38
Little Rock, Ark	69	79	66	76	62	73	58	69	54	66	51	62	48	58	45	54	43	52	41	50	39	48	38	47
Los Angeles, Cal	61	72	60	71	59	70	57	68	56	66	55	64	54	63	53	62	52	61	51	60	50	59	49	58
Louisville, Ky	66	76	63	74	59	70	55	66	51	62	47	57	44	52	41	48	39	45	37	43	35	41	33	39
Lynchburg, Va	67	72	64	70	60	66	56	61	51	57	47	54	44	51	41	48	39	45	37	43	35	41	34	39
Marquette, Mich	58	61	55	58	52	54	48	50	44	46	39	41	34	36	30	32	27	29	24	26	22	24	20	22
Memphis, Tenn	69	78	66	76	63	73	59	70	55	66	52	62	49	58	46	54	44	51	42	49	40	47	39	46
Meridian, Miss	69	76	66	74	62	71	58	67	54	63	51	60	48	58	46	56	44	54	43	52	42	51	41	50
Miles City, Mont	52	73	48	68	44	63	40	58	36	52	32	46	28	40	25	35	22	31	19	28	17	26	15	24
Milwaukee, Wis	61	67	58	64	54	60	50	56	46	52	42	48	38	43	34	38	31	34	28	31	25	29	23	27
Mobile, Ala	73	78	71	77	68	75	65	72	61	69	57	66	54	63	52	60	50	58	48	56	47	54	47	53
Montgomery, Ala	72	79	69	78	66	75	62	72	58	69	55	66	52	62	49	59	47	57	45	55	44	53	43	52
Moorhead, Minn	52	66	49	62	45	58	41	53	37	48	31	42	25	34	20	28	16	23	13	19	10	16	7	13
Nantucket, Mass	66	64	63	62	60	60	57	57	54	54	51	51	48	48	45	45	42	42	39	39	36	37	34	36
Nashville, Tenn	67	77	64	75	60	72	56	68	52	64	49	59	46	54	43	51	41	48	29	46	38	44	37	43
New Haven, Conn	64	67	62	64	58	61	54	57	50	53	46	49	42	45	38	42	35	39	32	36	29	33	27	31
New Orleans, La	76	79	74	78	71	76	68	74	65	71	62	68	59	65	56	62	54	60	52	58	51	57	50	56
New York, N. Y	66	70	64	68	60	64	56	60	52	56	48	52	44	48	41	45	38	42	35	39	33	36	31	35
Norfolk, Va	72	73	70	71	66	68	62	64	58	60	54	57	51	54	48	51	45	48	42	46	40	44	39	43
Northfield, Vt	56	59	53	56	50	53	46	49	42	45	38	41	34	37	30	33	26	29	22	26	19	23	16	21
North Platte, Nebr	56	73	52	70	48	65	43	60	38	55	34	50	30	45	27	40	24	37	22	34	20	32	18	30
Oklahoma, Okla	66	80	64	77	60	73	56	69	52	65	48	60	44	55	40	51	37	48	35	45	33	43	32	41
Omaha, Nebr	61	73	58	70	54	66	50	62	46	57	41	52	36	46	32	41	28	38	25	35	23	32	21	29
Oswego, N. Y	62	64	59	62	55	59	51	55	47	51	43	47	39	43	36	39	33	36	30	33	27	30	25	28
Palestine, Tex	70	82	68	80	65	77	61	74	58	70	55	66	52	62	50	59	48	57	46	55	45	54	44	53
Parkersburg, W. Va	64	71	60	68	56	64	52	60	48	56	45	52	42	48	39	45	36	42	34	40	32	38	31	37
Pensacola, Fla	77	80	75	79	72	77	68	74	65	70	62	67	59	64	56	62	54	60	52	58	50	57	49	56
Philadelphia, Pa	68	71	65	68	61	65	56	61	52	57	48	53	45	49	42	46	39	43	36	40	34	38	32	36

Normal temperatures by decades, 8 a. m. and 8 p. m.—Continued.

Stations.	September.						October.						November.						December.					
	1st decade.		2d decade.		3d decade.		1st decade.		2d decade.		3d decade.		1st decade.		2d decade.		3d decade.		1st decade.		2d decade.		3d decade.	
	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.	8 a. m.	8 p. m.
Phoenix, Ariz.	73	96	70	93	67	89	63	85	59	80	55	70	51	72	48	69	45	66	43	63	41	61	40	60
Pierre, S. Dak	57	75	53	71	49	66	45	60	40	54	35	47	30	40	26	35	22	32	20	29	18	26	16	24
Pittsburg, Pa	64	72	61	69	57	65	53	61	49	57	46	53	43	49	40	45	38	42	36	39	34	37	32	35
Pocatello, Idaho	48	74	45	70	42	65	39	59	36	53	33	48	30	43	27	38	24	34	22	30	20	27	19	26
Port Huron, Mich	60	65	57	63	54	59	50	55	46	51	42	46	38	42	35	38	32	35	29	32	27	30	25	28
Portland, Me.	61	62	58	59	54	56	50	52	46	48	42	44	39	40	35	37	31	34	28	31	25	28	23	26
Portland, Oreg.	56	71	55	68	53	65	51	62	49	59	47	56	45	52	43	49	41	47	40	45	39	43	38	42
Pueblo, Colo	55	76	52	73	48	69	44	64	40	59	36	54	33	49	30	45	28	42	26	40	24	38	23	37
Raleigh, N. C.	70	74	67	72	63	68	59	64	55	61	51	58	48	55	45	52	43	49	41	47	39	45	38	44
Rapid City, S. Dak.	56	71	53	67	50	62	46	57	42	52	38	47	34	42	31	38	28	34	26	31	24	29	22	27
Red Bluff, Cal	64	88	62	85	60	81	58	77	55	73	52	69	49	65	47	61	45	57	43	54	42	52	41	51
Rochester, N. Y.	62	65	59	62	55	58	51	54	47	50	43	46	40	42	37	39	34	36	31	33	29	31	27	29
Roseburg, Oreg.	51	74	50	71	49	68	47	65	46	62	45	59	43	55	42	52	41	49	40	47	39	45	39	44
Sacramento, Cal	58	82	57	80	56	78	55	75	53	72	51	69	49	65	47	61	45	58	43	55	42	52	41	50
St. Louis, Mo	67	77	64	74	60	70	56	66	52	62	48	56	44	51	40	47	37	44	35	41	33	39	31	37
St. Paul, Minn	57	68	54	64	50	60	46	56	42	51	37	45	32	39	27	33	24	29	21	26	18	23	15	20
Salt Lake City, Utah	60	76	56	72	52	67	49	61	46	56	43	52	40	48	37	44	34	40	31	37	29	34	27	33
San Antonio, Tex.	72	84	70	82	68	80	65	78	62	75	58	71	55	67	52	64	50	62	48	60	47	58	46	57
San Diego, Cal.	64	70	63	69	62	68	61	67	59	66	58	65	57	64	55	63	53	62	52	61	51	60	50	59
Sandusky, Ohio	64	69	61	66	57	62	53	58	49	54	45	50	41	46	38	42	35	39	32	36	30	33	28	31
San Francisco, Cal.	56	62	56	62	56	61	55	61	55	60	54	60	54	59	53	58	51	57	49	55	48	53	47	52
Santa Fe, N. Mex.	54	69	52	66	49	62	46	58	42	54	38	49	35	45	32	41	30	38	28	36	26	34	25	33
Sault Ste. Marie, Mich.	54	59	52	56	49	53	46	49	42	45	38	41	34	37	30	33	27	30	24	27	21	24	18	21
Savannah, Ga	75	76	73	75	70	73	66	70	62	67	59	64	56	61	53	59	50	57	48	55	47	53	46	52
Seattle, Wash.	54	66	53	64	52	61	50	58	48	55	46	52	44	49	43	47	42	46	41	45	41	44	40	43
Shreveport, La.	71	81	69	79	66	76	62	73	58	70	54	66	51	62	49	59	47	57	45	55	44	53	43	52
Sioux City, Iowa	58	.....	55	.....	52	.....	47	.....	42	.....	37	.....	32	.....	28	.....	25	.....	23	.....	21	.....	19	.....
Spokane, Wash.	51	72	48	68	45	64	42	60	40	56	38	51	36	46	34	41	32	38	30	36	28	34	26	32
Springfield, Ill	63	73	60	70	56	66	52	62	48	57	43	51	39	46	36	42	33	39	31	36	29	34	27	32
Springfield, Mo	65	74	62	72	58	68	54	64	50	60	46	56	42	52	38	48	35	44	33	41	31	39	30	37
Tacoma, Wash.	53	.....	52	.....	50	.....	48	.....	46	.....	45	.....	44	.....	43	.....	42	.....	41	.....	40	.....	39	.....
Tampa, Fla	77	78	76	77	74	76	72	75	70	73	67	71	64	69	62	67	60	65	58	63	56	61	55	60
Toledo, Ohio	62	69	59	66	55	62	51	58	47	54	43	49	39	44	36	40	33	37	31	34	29	32	27	30
Valentine, Nebr	54	72	50	68	46	64	42	59	38	54	35	49	32	44	29	39	26	26	23	33	20	30	17	27
Vicksburg, Miss	71	79	69	77	66	74	62	71	58	68	55	65	52	62	50	59	48	57	46	55	45	53	44	52
Walla Walla, Wash.	58	77	56	73	54	69	51	65	48	60	45	55	42	50	40	46	38	43	36	40	34	38	33	36
Washington, D. C.	68	71	64	68	60	64	56	60	52	56	48	52	44	49	41	46	38	43	35	40	33	38	32	37
Wichita, Kans	64	77	61	74	58	70	54	66	50	61	45	56	40	51	36	46	34	43	32	41	30	39	28	37
Williston, N. Dak.	50	68	46	64	42	59	38	54	34	48	30	41	24	34	19	28	16	24	18	20	10	17	8	14
Wilmington, N. C.	73	75	70	73	67	70	63	67	59	64	56	61	55	58	50	55	47	53	45	51	43	49	42	48
Winnemucca, Nev.	50	77	47	73	44	69	41	65	38	60	35	55	32	50	30	46	28	42	26	39	24	37	23	35
Yankton, S. Dak.	59	.....	56	.....	53	.....	48	.....	43	.....	38	.....	33	.....	29	.....	26	.....	23	.....	20	.....	18	.....
Yuma, Ariz.	74	97	72	95	68	91	64	87	61	83	58	79	55	75	53	71	51	68	49	66	48	64	47	63
Canadian stations.																								
St. Johns, N. F	58	53	56	51	53	49	50	47	47	45	44	43	41	40	38	37	35	34	32	32	30	30	28	28
Sydney, C. B. I	61	57	59	55	56	52	52	49	48	46	44	43	40	40	37	37	34	34	31	31	28	28	26	26
Halifax, N. S	61	59	59	57	56	54	52	51	48	48	44	45	40	42	37	39	34	36	31	33	28	30	26	28
Chatham, N. B.	58	58	55	55	51	52	47	48	43	44	39	40	35	36	31	32	26	28	21	24	16	20	13	17
Father Point, Que.	52	51	50	49	47	46	44	43	41	40	37	37	33	34	29	30	25	26	20	22	16	18	13	15
Quebec, Que.	55	59	52	56	49	52	45	48	41	44	37	40	33	35	29	30	24	26	19	22	15	19	12	16
Montreal, Que	59	61	56	58	52	54	48	50	44	46	39	42	34	37	30	32	26	28	22	24	18	21	15	18
Bissett, Ont.	53	57	50	54	46	50	42	46	38	42	34	38	30	34	26	30	22	25	17	20	13	17	9	14
White River, Ont.	48	56	45	52	42	48	38	44	34	39	29	33	24	27	19	22	14	18	9	14	5	10	2	8
Saugeen, Ont	59	61	57	58	53	54	49	50	45	46	41	42	38	39	35	36	32	33	29	30	27	28	25	26
Parry Sound, Ont.	57	61	54	58	50	54	46	50	42	46	38	42	34	38	30	34	27	30	24	27	21	24	18	21
Port Arthur, Ont	51	58	48	55	45	51	41	47	37	43	32	38	27	32	23	27	19	23	15	20	12	17	9	14
Winnipeg, Man	49	60	46	56	42	52	38	47	34	41	28	34	22	27	17	21	13	17	9	13	5	9	1	5
Minnedosa, Man.	46	59	43	55	40	50	36	45	32	40	26	33	20	26	16	19	12	15	8	11	4	8	1	5
Qu'Appelle, Assin	46	61	43	57	39	52	35	47	31	41	26	34	21	27	17	21	14	17	11	14	8	11	5	8
Medicine Hat, Assin.	48	66	45	62	42	58	39	54	35	49	30	42	26	35	22	29	19	25	17	22	15	19	13	17
Swift Current, Assin	46	63	43	59	40	55	36	50	32	44	28	38	23	32	19	27	16	23	13	19	11	16	9	13
Calgary, Alberta	43	62	41	58	38	54	35	50	32	45	28	40	24	35	21	30	18	27	15	24	13	21	12	18
Edmonton, Alberta	44	60	41	56	38	52	35	48	31	44	27	38	23	32	20	28	17	24	14	21	11	18	8	16
Prince Albert, Sask	44	58	41	54	37	50	33	45	29	40	23	32	18	24	14	18	10	13	6	9	2	6	−2	3
Battleford, Sask.	45	62	42	58	38	53	34	48	29	42	24	34	19	26	15	20	11	15	7	12	4	9	1	6

TABLE I.—*Annual climatological summary, Weather Bureau Stations*, 1901.

Districts and stations.	Elevation of barometer above sea level.	Pressure in inches.†			Temperature of the air, in degrees Fahrenheit.							Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation.			Winds.				Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Total snowfall, in inches.‡
		Mean actual, 8 a. m. + 8 p. m. ÷ 2.	Mean reduced.	Departure from normal.	Mean max. + mean min. ÷ 2.	Departure from normal.	Maximum.	Mean maximum.	Minimum.	Mean minimum.	Annual range.			Total, in inches.	Departure from normal.	Days with .01, or more.	Total movement, miles.	Prevailing direction.	Max. velocity. Miles, per hour.	Max. velocity. Direction.					
New England.					46.5	−0.2						73												5.6	
Eastport, Me	76	29.86	29.95	−.01	42.3	+0.8	93	49	−15	35	108	36	81	41.61	− 3.57	152	96,128	sw.	54	e.	112	82	171	6.4	89.7
Portland, Me	108	29.83	29.93	−.05	45.2	−0.5	96	52	−11	38	107	36	75	48.82	+ 6.56	142	82,814	nw.	58	se.	127	92	146	5.6	62.6
Northfield, Vt	876	29.03	29.99	−.02	41.6	+0.4	95	52	−24	32	119	34	79	31.42	− 4.32	146	76,538	s.	48	nw.	61	122	182	6.8	59.1
Boston, Mass	125	29.84	29.98	−.01	49.0	+0.4	97	56	− 3	42	100	40	74	48.72	+ 3.76	125	98,755	sw.	60	ne.	128	97	140	5.6	17.5
Nantucket, Mass	12	29.96	29.97	−.05	48.6	−0.2	86	54	2	44	84	42	81	32.88	− 7.85	145	132,338	sw.	68	e.	83	101	181	6.6	28.0
Block Island, R. I	26	29.95	29.98	−.04	48.2	−0.9	86	54	2	43	84	42	80	47.26	+ 3.07	120	152,838	nw.	81	ne.	134	115	116	5.0	10.5
Narragansett, R. I	.....	.....	.....	.....	47.7	−0.9	90	55	− 4	40	94	.....	.....	48.43	+ 0.93	113	.....	sw.	.....	.....	198	55	112	.....	13.9
New Haven, Conn	106	29.97	29.98	−.03	49.1	−0.3	97	57	− 1	41	98	40	75	52.61	+ 4.70	128	82,356	n.	45	ne.	172	83	110	4.5	13.4
Middle Atlantic States.					53.2	−0.2						74	74	42.54	− 1.21									5.4	
Albany, N. Y	97	29.80	30.00	−.01	48.5	+0.3	99	57	− 7	40	106	39	75	40.53	+ 2.67	139	67,625	s.	46	se.	120	103	142	5.8	40.5
Binghamton, N. Y	873	.....	.....	.....	46.6	+0.2	96	55	− 8	38	104	.....	.....	35.77	− 1.51	162	56,842	w.	35	sw.	82	119	164	6.3	34.1
New York, N. Y	314	29.66	30.00	−.04	52.3	+0.6	99	59	4	46	95	41	70	47.06	+ 2.26	133	127,267	nw.	72	nw.	127	104	134	5.4	9.2
Harrisburg, Pa	374	.....	.....	.....	51.9	+0.4	100	60	7	44	93	.....	.....	39.81	−14.25	110	66,909	nw.	40	w.	109	110	146	5.8	15.3
Philadelphia, Pa	117	29.89	30.01	−.04	53.8	+0.4	103	61	8	46	95	43	71	45.54	+ 5.70	126	95,319	nw.	48	ne.	126	90	149	5.6	10.6
Scranton, Pa	805	29.14	30.02	−.02	48.6	.....	98	57	− 5	40	103	39	74	39.26	.....	148	66,238	sw.	37	s.	93	105	167	6.3	31.9
Atlantic City, N. J.	52	29.95	30.01	−.02	51.4	−0.5	96	58	7	45	89	45	80	36.33	− 6.38	111	100,107	sw.	60	nw.	126	144	95	5.0	24.9
Baltimore, Md	123	29.88	30.01	−.04	54.4	−0.8	103	62	11	46	92	44	72	43.04	− 0.91	112	47,049	w.	32	ne.	122	119	124	5.3	8.7
Washington, D. C	112	29.90	30.02	−.04	54.1	−0.6	102	63	7	43	95	44	72	41.75	− 1.71	110	63,629	nw.	39	nw.	148	96	121	5.0	9.1
Cape Henry, Va	.....	.....	.....	.....	57.7	−1.0	101	65	17	51	84	.....	.....	50.66	− 1.68	127	118,774	s.	70	nw.	113	135	117	5.6	4.5
Lynchburg, Va	681	29.28	30.01	−.05	55.7	−1.2	97	66	8	46	89	44	72	54.81	+11.96	111	39,147	nw.	34	nw.	158	119	88	4.6	7.2
Norfolk, Va	91	29.93	30.03	−.02	58.5	−0.5	100	66	16	51	84	49	76	42.61	− 9.47	121	84,457	s.	46	nw.	151	103	111	5.0	7.3
Richmond, Va	144	.....	.....	.....	57.2	.....	99	66	9	48	90	.....	.....	42.05	.....	116	49,021	n.	35	sw.	130	119	116	5.1	15.1
South Atlantic States.					62.4	−1.5						74	74	50.69	− 0.68									4.7	
Charlotte, N. C	773	29.21	30.03	−.02	58.6	−1.3	95	68	10	49	85	46	70	62.82	+10.90	124	60,311	ne.	40	s.	155	90	120	4.9	1.0
Hatteras, N. C	11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Raleigh, N. C	376	29.65	30.05	−.02	58.7	−0.4	98	68	10	49	88	48	72	62.64	+16.55	129	55,867	sw.	31	sw.	162	101	102	4.7	2.5
Wilmington, N. C	78	29.96	30.05	.00	61.4	−1.6	95	70	16	53	79	52	78	54.14	− 0.20	115	75,495	sw.	42	nw.	140	133	92	4.6	9.0
Charleston, S. C	48	30.00	30.05	−.01	64.2	−1.6	96	71	21	57	75	54	75	32.70	−24.04	123	91,470	s.	50	se.	126	162	77	4.7	1.1
Columbia, S. C	351	.....	.....	.....	61.7	−2.0	100	72	16	52	84	.....	.....	51.22	+ 3.67	127	.....	ne.	.....	.....	132	148	85	4.9	6.3
Augusta, Ga	180	29.84	30.03	−.01	62.2	−1.7	99	72	13	52	86	51	72	50.94	+ 2.62	113	55,254	nw.	46	ne.	102	119	84	4.4	5.3
Savannah, Ga	65	29.97	30.03	−.04	65.0	−1.4	97	73	18	57	79	54	76	36.84	−15.07	111	67,674	sw.	38	se.	155	140	70	4.3	T.
Jacksonville, Fla	43	29.99	30.04	.00	67.0	−2.0	97	76	20	58	77	57	77	54.22	+ 0.10	124	70,584	nw.	61	s.	133	120	112	5.0	0.0
Florida Peninsula.					72.4	−1.7						78	73	51.72	+ 1.94									4.7	
Jupiter, Fla	28	29.98	30.01	−.02	72.6	−1.0	92	79	38	66	54	64	79	76.08	+18.10	146	90,493	se.	49	n.	138	171	56	4.7	0.0
Key West, Fla	22	29.99	30.01	+.01	74.7	−2.4	89	79	50	70	39	66	77	37.02	− 1.44	108	89,473	ne.	48	w.	168	141	56	4.3	0.0
Tampa, Fla	34	29.99	30.03	−.01	70.0	−1.6	94	78	24	62	70	60	78	42.06	−10.84	121	55,207	ne.	43	se.	122	157	86	5.0	0.0
East Gulf States.					64.3	−1.3						72	72	55.63	− 0.94									4.6	
Atlanta, Ga	1,174	28.81	30.05	−.03	59.4	−1.8	98	68	6	50	92	47	69	59.77	+ 9.39	125	96,615	nw.	56	nw.	148	131	86	4.8	4.4
Macon, Ga	370	.....	.....	.....	61.9	.....	101	72	11	52	90	.....	.....	42.03	.....	111	56,123	nw.	45	sw.	152	95	118	4.7	4.0
Pensacola, Fla	56	.....	.....	.....	66.6	−1.0	103	74	17	60	86	.....	.....	52.12	− 4.97	105	85,227	ne.	70	sw.	168	106	91	4.6	T.
Mobile, Ala	57	29.98	30.04	.00	65.4	−1.3	102	74	16	57	86	54	75	62.34	− 0.27	113	67,103	n.	60	se.	172	98	95	4.6	0.2
Montgomery, Ala	223	29.81	30.05	−.01	63.7	−1.5	103	74	12	54	93	51	70	52.24	− 0.48	98	57,640	n.	36	sw.	163	109	93	4.5	4.0
Meridian, Miss	375	.....	.....	.....	62.0	−2.0	104	73	10	51	94	.....	.....	47.63	− 9.36	101	47,980	sw.	44	nw.	167	115	83	4.3	8.3
Vicksburg, Miss	247	29.76	30.03	−.02	64.6	−0.7	100	74	13	55	87	52	70	57.57	+ 1.91	97	59,428	se.	42	nw.	148	127	90	4.5	3.2
New Orleans, La	51	29.98	30.04	+.02	68.2	−0.6	102	76	23	60	79	57	74	57.73	− 2.79	104	74,299	ne.	49	ne.	160	127	78	4.4	T.
West Gulf States.					66.3	+0.6						71	71	31.82	−11.33									4.3	
Shreveport, La	249	29.77	30.03	−.01	65.1	−0.1	107	75	14	55	93	53	71	36.65	−11.95	87	59,449	se.	38	se.	172	75	118	4.5	1.4
Fort Smith, Ark	457	29.53	30.02	+.01	62.0	+2.2	106	73	6	51	100	49	69	22.77	−21.97	74	74,673	e.	52	sw.	126	175	64	4.2	0.2
Little Rock, Ark	357	29.66	30.05	+.01	61.9	+0.4	106	72	6	52	100	49	70	36.81	−16.82	83	64,387	nw.	48	nw.	177	109	79	4.2	0.1
Corpus Christi, Tex	18	29.98	30.00	−.01	70.7	+0.6	98	77	20	64	78	62	79	17.50	−12.70	72	102,577	se.	48	ne.	177	121	67	3.8	0.0
Fort Worth, Tex	670	29.29	29.99	−.03	65.9	.....	108	77	9	55	99	48	62	19.65	.....	60	100,962	s.	58	w.	163	146	56	4.0	2.8
Galveston, Tex	54	29.94	29.99	−.02	69.2	−0.6	98	74	25	64	73	62	81	51.33	+ 2.65	82	104,256	se.	48	n.	149	119	97	4.8	0.0
Palestine, Tex	510	29.48	30.02	−.02	65.7	+0.5	101	75	13	56	88	54	73	41.22	− 5.29	64	64,870	s.	48	nw.	164	120	81	4.5	2.0
San Antonio, Tex	701	29.26	29.99	−.01	69.7	+1.2	103	81	15	58	88	53	65	16.44	−13.26	71	66,508	se.	48	nw.	138	144	83	4.6	0.0
Ohio Valley and Tenn.					55.2	−0.8						72	72	35.68	− 2.57									5.1	
Chattanooga, Tenn	762	29.26	30.07	.00	58.4	−1.5	100	68	5	49	95	45	68	53.44	+ 0.54	114	61,307	sw.	55	s.	145	130	90	4.7	T.
Knoxville, Tenn	1,004	28.99	30.06	−.02	56.2	−1.0	98	66	0	46	98	45	75	55.75	+ 4.76	123	62,089	sw.	46	sw.	156	105	104	4.7	4.5
Memphis, Tenn	397	29.63	30.06	+.02	61.4	+0.3	104	70	2	53	102	49	68	34.58	−18.70	80	84,203	nw.	75	sw.	162	117	86	4.5	T.
Nashville, Tenn	546	29.48	30.07	+.03	58.0	−1.3	102	68	− 2	48	104	45	68	38.11	−11.99	109	58,839	nw.	58	se.	169	99	97	4.5	4.1
Lexington, Ky	989	.....	.....	.....	53.6	−1.3	102	63	− 8	45	110	.....	.....	30.32	−14.06	121	87,676	s.	57	nw.	149	129	87	4.8	9.0
Louisville, Ky	525	29.47	30.04	−.01	56.2	−0.5	107	66	− 7	47	114	44	70	29.53	−16.23	103	70,396	n.	45	sw.	165	88	112	4.7	3.4
Evansville, Ind	434	.....	.....	.....	56.4	.....	107	64	− 6	47	113	.....	.....	29.00	.....	97	59,674	ne.	39	s.	224	67	74	3.3	0.8
Indianapolis, Ind	822	29.15	30.04	.00	52.0	−0.7	106	61	−10	43	116	41	70	30.33	−12.63	108	87,843	nw.	48	s.	115	129	121	5.5	20.8
Cincinnati, Ohio	638	29.36	30.04	−.01	54.0	−1.1	105	63	− 7	45	112	42	70	17.99	−21.88	111	67,589	se.	52	nw.	119	113	133	5.5	9.3
Columbus, Ohio	824	29.15	30.04	.00	51.8	−0.3	104	61	− 7	43	111	41	73	26.51	−12.36	142	68,559	sw.	42	sw.	109	103	153	5.9	21.7
Pittsburg, Pa	842	29.11	30.02	−.02	52.6	−0.3	98	61	− 2	44	96	41	71	40.76	+ 4.08	156	54,695	nw.	30	s.	118	131	116	5.6	43.8
Parkersburg, W. Va	638	29.37	30.06	−.01	53.0	−1.4	102	62	− 5	44	107	44	78	35.14	− 6.83	145	50,403	s.	43	nw.	118	114	133	5.7	19.0
Elkins, W. Va	1,940	27.98	30.08	+.01	48.3	.....	94	60	− 6	37	100	40	82	46.49	.....	181	39,110	w.	36	s.	60	166	139	6.5	58.2
Lower Lake Region.					48.0	−0.2						76	76	33.59	− 1.96									6.2	
Buffalo, N. Y	767	29.16	29.99	−.02	47.6	+1.1	91	54	− 2	41	93	39	74	35.49	− 2.55	189	123,042	sw.	64	w.	41	156	168	7.2	96.6
Oswego, N. Y	335	29.61	29.98	−.04	46.0	−0.4	94	53	− 4	39	98	38	77	45.09	+10.07	175	95,438	s.	48	s.	78	87	200	6.7	99.8
Rochester, N. Y	523	29.42	29.99	−.02	47.1	+0.3	96	55	− 3	39	99	39	77	37.20	+ 2.38	191	75,152	sw.	40	nw.	99	116	150	6.1	141.5
Erie, Pa	713	29.23	30.00	−.01	48.2	−0.5	91	55	− 2	41	93	41	81	31.67	− 9.61	165	95,598	w.	52	s.	86	102	177	6.5	59.9
Cleveland, Ohio	762	29.19	30.01	.00	48.7	−0.2	92	55	− 6	42	98	39	72	38.71	+ 2.42	153	128,566	sc.	60	w.	104	98	163	5.9	41.0
Sandusky, Ohio	629	29.33	30.01	−.03	49.3	−0.7	98	56	− 7	42	105	40	75	25.50	− 9.41	137	74,345	sw.	44	nw.	93	111	161	6.1	19.3
Toledo, Ohio	628	29.34	30.02	.00	48.9	−0.7	97	57	− 8	41	105	39	73	26.29	− 4.64	118	87,069	sw.	52	se.	137	114	114	5.2	32.4
Detroit, Mich	730	29.21	30.00	−.02	48.0	−0.1	94	56	− 6	40	100	39	75	28.78	− 3.55	117	100,933	sw.	56	s.	113	118	134	5.6	41.7
Upper Lake Region.					43.8	+0.9						73	73	26.24	− 6.36									6.1	
Alpena, Mich	609	29.33	30.01	.00	42.5	+1.2	98	50	− 8	35	106	36	80	25.23	− 9.85	136	90,313	w.	54	se.	87	82	196	6.7	50.2
Escanaba, Mich	612	29.33	30.01	+.02	41.3	+1.1	88	49	−13	33	101	36	83	29.97	− 2.49	123	77,168	n.	38	w.	89	107	169	6.4	43.6
Grand Haven, Mich	632	29.31	30.00	.00	46.4	+0.1	94	54	− 5	39	99	40	78	26.45	− 8.32	154	102,306	nw.	49	sw.	100	99	166	6.1	62.1
Houghton, Mich	668	.....	.....	.....	41.1	.....	103	50	−11	32	114	.....	.....	29.61	.....	165	62,657	e.	44	w.	103	98	164	6.2	95.5
Marquette, Mich	734	29.20	30.01	+.01	41.7	+1.2	108	48	− 9	36	117	35	81	37.19	+ 4.82	170	94,996	nw.	68	sw.	80	108	177	6.5	78.9
Port Huron, Mich	638	29.38	30.03	+.02	46.2	+1.0	96	55	− 6	38	102	38	79	20.36	−11.24	124	101,097	sw.	50	w.	110	112	143	5.9	45.0
Sault Ste. Marie, Mich.	614	29.30	29.98	−.02	40.6	+1.6	93	49	−18	32	111	34	79	27.38	− 2.15	132	71,981	e.	54	nw.	98	109	158	6.2	60.9
Chicago, Ill	823	29.13	30.02	.00	48.0	−0.3	103	54	−12	41	115	40	79	24.52	−10.24	114	145,193	ne.	58	ne	154	106	105	5.0	40.9
Milwaukee, Wis	681	29.28	30.02	.00	46.7	+1.7	100	54	−14	40	114	38	77	18.11	−13.95	112	96,100	w.	50	ne.	105	81	179	6.1	58.4
Green Bay, Wis	617	29.34	30.02	+.02	44.3	+0.9	99	53	−20	36	119	35	72	26.46	− 5.84	123	70,309	n.	43	sw.	77	120	168	6.7	44.1
Duluth, Minn	702	29.24	30.02	+.02	40.0	+0.7	98	47	−25	33	124	31	76	26.68	− 4.33	118	86,468	ne.	56	nw.	117	131	117	5.5	43.1
North Dakota.					42.0	+3.3						75	75	21.37	+ 2.42									4.6	
Moorhead, Minn	935	28.99	30.03	+.01	41.5	+3.9	97	52	−32	31	129	34	81	20.16	+ 6.39	106	90,181	nw.	54	se.	143	105	117	5.1	32.3
Bismarck, N. Dak	1,674	28.22	30.02	+.01	43.0	+3.4	106	54	−26	32	132	31	68	15.59	− 2.79	73	85,897	nw.	48	nw.	175	106	84	4.5	18.7
Williston, N. Dak	1,875	27.98	30.00	.00	41.6	+2.7	99	53	−28	30	127	32	76	18.36	+ 3.66	106	81,228	nw.	60	n.	213	104	48	4.3	30.0
Upper Mississippi Valley.					51.1	+1.2						70	70	24.07	−10.15									4.6	
Minneapolis, Minn	.....	.....	.....	.....	45.2	+0.9	102	55	−27	36	129	.....	.....	22.30	− 4.91	98	100,647	nw.	56	w.	101	142	122	.....	41.5
St. Paul, Minn	837	29.09	30.01	.00	45.6	+2.3	104	54	−25	37	129	35	72	25.75	− 1.72	106	69,383	nw.	56	w.	134	134	97	5.0	37.9

TABLE I.—*Annual climatological summary, Weather Bureau stations*, 1901—Continued.

Districts and stations.	Elevation of barometer above sea level.	Pressure in inches.†			Temperature of the air, in degrees Fahrenheit.							Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation.			Winds.				Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Total snowfall, in inches.‡
		Mean actual, 8 a. m.+8 p. m.÷2.	Mean reduced.	Departure from normal.	Mean max. mean min. ÷ 2.	Departure from normal.	Maximum.	Mean maximum.	Minimum.	Mean minimum.	Annual range.			Total, in inches.	Departure from normal.	Days with .01, or more.	Total movement, miles.	Prevailing direction.	Max. velocity. Miles, per hour.	Max. velocity. Direction.					
Upper Miss. Val.—Con.																									
La Crosse, Wis	714	.....	.....	.....	47.0	+1.0	104	56	−23	38	127	.....	.....	34.93	+ 4.25	108	60,397	s.	44	w.	127	138	100	5.0	43.2
Davenport, Iowa	606	29.35	30.01	−.02	50.2	+1.0	106	59	−13	41	119	39	71	17.33	−16.39	90	67,015	w.	36	w.	185	85	95	4.2	30.6
Des Moines, Iowa	861	29.10	30.04	+.02	50.6	+2.1	109	61	−18	40	127	40	72	19.77	−13.34	76	68,838	nw.	42	sw.	133	147	85	4.9	51.9
Dubuque, Iowa	698	29.26	30.03	+.01	48.6	+1.0	106	58	−17	39	123	37	70	20.39	−15.14	96	67,010	nw.	39	nw.	147	116	102	4.8	39.0
Keokuk, Iowa	614	29.35	30.01	−.01	52.8	+1.4	108	62	−12	44	120	41	71	22.54	−12.18	79	66,373	sw.	38	sw.	186	98	81	3.9	8.9
Cairo, Ill	356	29.66	30.05	+.01	57.6	−0.1	106	67	− 4	49	110	46	71	31.68	−11.15	94	70,826	s.	48	w.	139	133	93	4.8	4.2
Springfield, Ill	644	29.34	30.04	.00	52.7	+0.4	107	62	−11	43	118	40	68	25.51	−12.50	101	81,165	nw.	48	sw.	149	107	109	4.9	11.0
Hannibal, Mo	534	.....	.....	.....	54.0	+1.5	108	64	−18	44	126	.....	.....	19.72	−12.24	91	78,529	sw.	52	s.	165	118	82	4.4	11.0
St. Louis, Mo	567	29.42	30.03	−.01	57.4	+1.8	107	66	−10	49	117	43	65	24.80	−16.28	82	84,482	s.	53	sw.	181	84	100	4.3	17.1
Missouri Valley.					52.1	+2.3							66	24.14	− 5.34									4.4	
Columbia, Mo	784	.....	.....	.....	55.1	+0.1	111	67	−23	43	124	.....	.....	21.35	−18.58	82	73,293	nw.	43	w.	162	86	117	4.8	9.7
Kansas City, Mo	963	29.01	30.04	+.02	55.9	+2.7	106	65	− 8	46	114	41	64	24.76	−11.58	79	72,768	s.	40	sw.	172	92	101	4.3	30.0
Springfield, Mo	1,324	28.63	30.03	.00	56.7	+1.8	106	66	−11	47	117	43	67	31.72	−14.00	75	90,008	se.	45	w.	198	109	58	3.7	9.1
Topeka, Kans	.....	.....	.....	.....	55.3	+1.5	106	66	− 8	45	114	.....	.....	25.98	− 8.42	81	.....	s.	.....	.....	131	165	59	4.4	30.3
Lincoln, Nebr	1,189	28.72	29.99	−.04	52.3	+2.2	106	63	−13	42	119	39	67	22.09	− 4.22	88	96,729	se.	60	n.	170	115	80	4.3	29.1
Omaha, Nebr	1,105	28.82	30.00	−.05	52.1	+2.5	105	62	−16	42	121	40	70	25.08	− 6.61	90	74,788	se.	40	n.	144	128	93	4.8	31.0
Valentine, Nebr	2,598	27.25	29.98	−.06	48.2	+1.9	104	61	−34	36	138	34	67	24.84	+ 5.69	89	91,343	nw.	58	nw.	181	116	68	4.1	30.0
Sioux City, Iowa	1,135	.....	.....	.....	49.4	+2.4	106	59	−22	40	128	.....	.....	26.59	+ 2.09	101	110,222	nw.	58	nw.	169	107	89	4.4	27.1
Pierre, S. Dak	1,572	28.32	30.00	−.03	49.4	+4.0	108	61	−19	38	127	33	60	17.04	+ 1.27	106	72,906	se.	49	nw.	154	105	106	4.6	17.3
Huron, S. Dak	1,306	28.60	30.02	−.02	46.2	+3.9	108	58	−22	34	130	34	70	21.98	+ 0.95	96	108,724	se.	63	se.	141	162	62	4.6	10.9
Northern Slope.					46.5	+2.4							67	15.89	+ 1.52									4.6	
Havre, Mont	2,505	27.32	29.98	−.03	44.2	+3.1	97	56	−25	33	122	34	72	15.06	+ 0.94	77	84,761	sw.	50	sw.	132	169	64	4.6	32.6
Miles City, Mont	2,371	27.44	29.94	−.08	47.9	+3.7	111	60	−24	36	135	40	84	13.90	+ 1.19	72	.....	nw.	60	nw.	195	122	48	3.8	12.2
Helena, Mont	4,110	25.79	30.00	−.03	45.2	+2.1	97	54	−12	36	109	29	58	14.71	+ 1.53	89	66,551	sw.	56	sw.	80	125	160	6.0	44.2
Kalispell, Mont	2,965	26.92	30.03	+.01	43.3	.....	91	53	− 5	33	96	32	70	12.85	.....	121	47,860	w.	40	sw.	139	110	116	5.0	37.8
Rapid City, S. Dak	3,234	26.59	29.94	−.07	48.1	+2.1	101	60	−24	36	125	34	64	23.35	+ 6.64	89	70,201	w.	48	s.	184	118	68	4.0	14.1
Cheyenne, Wyo	6,088	23.99	29.99	−.02	45.6	+1.2	95	58	−22	33	117	28	57	14.99	+ 2.79	91	94,206	nw.	66	w.	156	143	66	4.3	54.1
Lander, Wyo	5,372	24.63	30.03	.00	44.2	+1.8	99	59	−36	30	135	29	64	12.82	− 0.63	67	37,247	sw.	42	w.	132	167	66	4.6	72.3
North Platte, Nebr	2,821	27.08	30.03	+.01	50.5	+2.6	102	63	−30	38	132	37	66	16.44	− 1.83	72	79,657	se.	53	nw.	158	146	61	4.6	27.2
Middle Slope.					55.2	+1.8							62	16.42	− 5.92									4.3	
Denver, Colo	5,291	24.71	29.90	.00	51.6	+2.2	100	65	−19	38	119	31	54	9.10	− 5.39	66	72,262	sw.	61	nw.	177	128	60	4.0	44.6
Pueblo, Colo	4,685	25.27	29.97	−.01	52.0	+0.9	103	67	−23	37	126	31	54	11.86	− 0.25	69	59,885	nw.	50	n.	170	158	37	4.1	21.6
Concordia, Kans	1,398	28.53	30.02	−.02	54.3	+2.1	104	65	−10	43	114	42	70	18.27	− 7.22	74	67,984	s.	39	nw.	158	123	84	4.4	31.9
Dodge, Kans	2,509	27.38	29.98	−.02	55.6	+2.5	104	69	−11	42	115	40	67	16.06	− 3.78	74	99,329	se.	56	se.	194	121	50	4.1	17.1
Wichita, Kans	1,358	28.59	30.02	+.02	57.3	+1.9	104	68	− 6	46	110	41	63	27.47	− 1.30	76	78,672	s.	52	nw.	183	100	82	4.0	14.7
Oklahoma, Okla	1,214	28.72	30.01	+.01	60.3	+0.9	104	71	− 2	49	106	44	62	15.74	−17.55	56	91,081	s.	48	nw.	157	123	85	4.6	2.3
Southern Slope.					60.6	+1.4							59	20.06	− 1.54									4.2	
Abilene, Tex	1,738	28.18	29.98	−.03	65.0	+1.6	103	76	− 9	54	94	46	58	15.71	− 9.31	51	82,041	se.	50	w.	160	124	81	4.5	4.0
Amarillo, Tex	3,676	26.24	29.98	−.02	56.1	+1.3	97	68	− 1	44	98	38	60	24.42	+ 6.23	68	138,029	sw.	80	nw.	190	118	57	3.8	7.2
Southern Plateau.					60.4	+0.5							41	10.22	− 0.38									2.6	
El Paso, Tex	3,762	26.16	29.94	−.01	64.2	+0.8	103	78	19	51	84	34	42	8.68	− 0.65	51	93,763	nw.	74	w.	190	139	36	3.3	0.3
Santa Fe, N. Mex	7,013	23.27	29.98	−.01	49.9	+1.6	89	60	1	39	88	30	53	17.41	+ 3.16	105	59,635	se.	43	se.	225	114	26	3.1	38.8
Flagstaff, Ariz	6,907	23.34	30.07	.....	46.8	−0.9	92	61	− 4	32	96	.....	.....	21.48	− 0.78	83	.....	sw.	.....	.....	140	125	100	.....	124.5
Phoenix, Ariz	1,108	28.73	29.88	−.06	70.6	+1.5	112	85	24	56	88	38	37	4.87	− 2.06	29	37,734	e.	38	ne.	233	88	44	2.8	0.0
Yuma, Ariz	141	29.71	29.85	−.04	72.2	0.0	114	87	24	58	90	41	40	3.65	+ 0.68	10	56,658	n.	42	n.	314	38	13	1.1	0.0
Independence, Cal	3,910	25.96	29.90	−.04	58.7	+0.1	101	71	13	46	88	26	32	5.21	− 0.52	31	73,716	nw.	54	w.	234	125	6	2.5	8.5
Middle Plateau.					51.5	+1.2							51	10.92	− 0.37									4.0	
Carson City, Nev	4,720	25.27	30.02	+.03	49.9	+0.5	97	64	− 8	36	105	33	60	10.67	− 1.30	65	58,070	sw.	61	sw.	186	96	83	3.9	29.2
Winnemucca, Nev	4,344	25.63	30.01	+.01	48.6	0.0	99	63	− 5	35	104	28	51	8.73	+ 0.25	68	79,588	sw.	70	s.	150	74	141	5.1	25.8
Modena, Utah	5,479	24.60	30.04	.....	49.3	.....	98	65	−12	34	110	24	48	9.20	.....	54	.....	w.	60	sw.	.....	.....	.....	3.2	.....
Salt Lake City, Utah	4,366	25.61	30.00	−.03	53.3	+2.0	101	63	4	44	97	31	49	16.08	− 0.11	79	51,679	se.	54	nw.	203	86	76	3.8	50.9
Grand Junction, Colo	4,608	25.36	29.98	−.04	54.1	+2.1	103	68	0	40	103	28	46	8.19	− 0.31	71	43,649	se.	39	sw.	171	120	74	4.0	16.7
Northern Plateau.					50.1	+1.7							62	11.66	− 4.31									5.3	
Baker City, Oreg	3,471	26.45	30.05	.00	46.8	+1.9	94	57	1	37	93	30	59	10.64	− 4.51	103	51,615	s.	33	sw.	107	80	178	6.0	28.2
Boise, Idaho	2,739	27.17	30.02	−.02	52.5	+1.8	104	64	9	40	95	33	56	9.59	− 4.83	73	37,448	nw.	35	ne.	140	131	94	4.8	20.1
Lewiston, Idaho	737	.....	.....	.....	54.4	.....	107	65	17	44	90	.....	.....	12.44	.....	105	33,345	e.	40	nw.	134	118	113	5.1	8.6
Pocatello, Idaho	4,482	25.47	30.00	−.05	49.2	+3.8	102	61	−13	38	115	32	57	7.56	− 7.71	79	88,989	w.	48	n.	158	102	105	4.9	33.7
Spokane, Wash	1,943	27.97	30.03	+.01	48.9	+1.1	99	59	10	39	89	35	65	15.99	− 2.26	113	48,939	s.	38	sw.	90	109	166	6.2	31.9
Walla Walla, Wash	1,000	28.96	30.03	−.01	53.3	+0.1	102	63	11	44	91	44	75	14.52	− 2.25	103	49,229	s.	40	sw.	142	150	73	4.7	17.4
North Pacific Coast.					50.4	+0.1							79	50.72	− 1.96									6.3	
Neah Bay, Wash	50	29.97	30.03	+.01	48.2	−1.4	74	53	29	44	45	44	88	113.08	+ 5.83	218	68,724	w.	60	w.	89	62	214	7.0	17.8
Port Crescent, Wash	259	.....	.....	.....	46.4	−0.2	88	54	23	39	65	.....	.....	39.89	− 6.39	169	35,345	w.	48	sw.	76	128	161	6.3	18.0
Seattle, Wash	123	29.93	30.06	+.03	52.0	+1.1	87	59	28	45	59	43	76	30.18	− 5.72	153	46,932	se.	33	se.	89	137	139	6.0	16.1
Tacoma, Wash	213	.....	.....	.....	50.6	+0.8	88	58	24	43	64	.....	.....	45.75	+ 1.12	156	52,111	sw.	36	sw.	79	107	179	6.5	23.2
Portland, Oreg	154	29.90	30.06	.00	52.6	+0.1	94	60	26	45	68	44	77	41.05	− 5.78	158	73,870	nw.	52	s.	88	98	179	6.5	17.1
Roseburg, Oreg	518	29.48	30.05	−.02	52.8	+0.1	101	62	21	44	80	43	75	34.37	− 0.79	143	30,471	nw.	30	sw.	123	124	118	5.3	0.3
Middle Pacific.					57.6	+0.2							69	26.46	− 2.68									3.3	
Eureka, Cal	62	30.00	30.06	+.01	51.8	+0.4	76	57	31	47	45	46	83	42.04	− 3.79	112	52,092	nw.	43	nw.	116	130	119	5.2	0.0
Mount Tamalpais, Cal	2,375	27.54	30.01	−.01	56.0	.....	94	62	28	50	66	37	59	27.27	.....	69	163,203	nw.	90	se.	238	70	57	2.9	1.3
Red Bluff, Cal	332	29.62	29.97	−.02	63.1	+0.6	111	74	25	52	86	42	55	25.51	− 0.60	66	51,522	n.	46	n.	233	64	68	3.1	13.0
Sacramento, Cal	69	29.90	29.98	−.01	60.1	+0.3	105	71	26	49	79	46	66	18.52	− 2.35	53	71,218	se.	60	se.	209	81	75	3.7	0.0
San Francisco, Cal	155	29.87	30.03	+.02	55.2	−0.6	91	61	37	49	54	48	82	19.75	− 3.96	58	89,409	w.	57	se.	174	109	82	4.2	0.0
South Pacific.					61.5	+0.5							69	13.80	− 0.78									3.4	
Fresno, Cal	330	29.61	29.96	−.01	63.5	+0.5	110	76	27	51	83	42	57	8.01	− 0.99	42	47,589	nw.	28	nw.	227	77	61	3.2	0.0
Los Angeles, Cal	338	29.60	29.95	−.01	62.1	+0.7	97	73	31	51	66	49	73	11.96	− 5.34	32	38,926	w.	24	nw.	126	206	33	3.8	0.0
San Diego, Cal	87	29.86	29.96	−.02	61.2	+0.5	96	67	35	56	61	51	74	9.49	− 1.02	39	49,237	nw.	35	sw.	262	58	45	3.0	0.0
San Luis Obispo, Cal	201	29.80	30.02	+.03	59.1	+0.4	105	71	22	47	83	46	71	25.76	+ 4.24	39	44,381	n.	25	n.	219	92	54	3.5	0.0
West Indies.																									
Basseterre, St. Kitts	29	29.94	29.97	.....	79.4	.....	89	84	68	74	21	71	76	61.15	.....	203	78,752	e.	47	se.	135	188	42	4.6	
Bridgetown, Barbados	30	29.91	29.94	.....	79.6	.....	90	86	67	74	23	72	77	70.02	.....	200	71,858	e.	52	s.	126	118	121	5.4	
Havana, Cuba	57	29.93	29.99	.....	75.3	.....	94	82	50	69	44	68	83	55.91	.....	128	98,190	e.	48	e.	118	179	68	4.8	
Kingston, Jamaica	286	29.63	29.93	.....	78.0	.....	94	86	61	70	33	69	77	47.01	.....	122	52,496	ne.	32	se.	92	212	61	5.2	
Port of Spain, Trinidad	40	29.89	29.93	.....	79.6	.....	92	87	66	72	26	71	77	56.71	.....	185	38,308	e.	22	e.	49	143	173	6.8	
Puerto Principe, Cuba	352	29.64	29.98	.....	76.2	.....	96	86	47	66	49	68	84	54.66	.....	139	60,974	ne.	36	e.	128	154	83	4.9	
Roseau, Dominica	25	29.92	29.95	.....	79.9	.....	91	86	66	74	25	69	72	65.71	.....	200	46,250	ne.	38	se.	147	128	80	4.7	
San Juan, Porto Rico	82	29.89	29.97	.....	78.9	.....	98	85	67	73	26	71	79	75.70	.....	207	87,467	e.	52	se.	184	135	96	4.9	
Santiago de Cuba, Cuba	82	29.87	29.95	.....	79.1	.....	94	87	57	70	37	69	78	57.59	.....	109	42,272	n.	54	se.	141	164	60	4.7	
Willemstad, Curaçao	75	29.81	29.88	.....	81.1	.....	90	86	70	76	20	73	78	25.13	.....	112	94,555	e.	27	e.	189	222	54	5.0	

*Two or more directions. †Reduced to standard gravity. ‡For the snow year, July 1, 1900, to June 30, 1901.

TABLE II.—*Annual climatological summary, Canadian stations,* 1901.

Stations.	Pressure.* Mean not reduced.	Pressure.* Mean reduced.	Pressure.* Departure from normal.	Temperature. Mean.	Temperature. Departure from normal.	Temperature. Mean maximum.	Temperature. Mean minimum.	Precipitation Total.	Precipitation Departure from normal.	Total depth of snowfall.†
	Ins.	*Ins.*	*Ins.*	°	°	°	°	*Ins.*	*Ins.*	*Ins.*
St. Johns, N. F	29.71	29.86	—.07	42.5	+2.0	49.2	35.7	45.54	— 9.73	36.1
Sydney, C. B. I.	29.88	29.92	—.01	44.6	+3.3	52.7	36.6	54.67	+ 2.33	87.2
Halifax, N. S	29.83	29.94	—.02	46.2	+3.4	54.3	38.1	58.81	+ 3.37	77.3
Grand Manan, N. B	29.88	29.93	—.05	43.9	+1.1	50.8	37.0	49.34	+ 4.72	87.8
Yarmouth, N. S	29.88	29.96	—.02	44.8	+1.6	51.7	37.8	46.93	+ 0.80	69.2
Charlottetown, P. E. I	29.87	29.91	—.04	44.5	+3.5	52.5	36.4	30.93	—10.85	71.0
Chatham, N. B	29.90	29.92	—.04	41.9	+3.2	51.8	32.0	33.98	— 9.98	87.9
Father Point, Que.	29.88	29.91	—.04	36.4	+1.6	44.2	28.5	32.08	+ 2.23	93.8
Quebec, Que	29.61	29.95	—.03	40.3	+2.1	48.2	32.3	45.96	+ 3.18	94.3
Montreal, Que	29.75	29.96	—.02	43.0	+1.5	50.2	35.7	46.19	+ 7.38	123.7
Bissett, Ont	29.38	30.00	+.02	38.6	+0.4	51.2	26.0	28.70	— 2.35	62.8
Ottawa, Ont	29.66	29.98	.00	42.8	+2.2	52.3	33.3	33.31	+ 0.45	79.1
Kingston, Ont	29.66	29.98	.00	44.4	+1.3	52.0	36.9	35.35	+ 1.41	54.3
Toronto, Ont	29.61	29.99	—.03	46.0	+1.8	54.5	37.6	32.19	+ 1.44	64.6
White River, Ont	28.65	30.03	.00	33.2	+1.3	47.2	19.3	27.28	+ 3.69	91.0
Port Stanley, Ont	29.36	30.00	—.02	45.6	+0.9	54.2	36.9	32.50	— 1.67	73.4
Saugeen, Ont	29.27	30.00	.00	44.2	+1.8	52.2	36.3	35.96	+ 1.58	130.3
Parry Sound, Ont	29.28	29.99	—.01	42.2	+2.0	52.2	32.2	50.30	+12.98	145.7
Port Arthur, Ont	29.29	30.00	.00	36.1	+1.7	45.8	26.4	22.51	— 1.53	19.2
Winnipeg, Man	29.20	30.05	+.03	36.3	+3.2	48.1	24.6	23.90	+ 0.45	35.5
Minnedosa, Man	28.16	30.01	+.01	36.3	+4.7	47.7	24.9	19.95	+ 2.22	49.9
Qu'Appelle, Assin	27.68	29.98	—.02	36.3	+3.0	46.6	26.0	27.91	+12.97	126.9
Medicine Hat, Assin	27.66	29.97	—.01	42.9	+2.6	54.7	31.0	21.28	+10.51	71.2
Swift Current, Assin	27.37	29.98	—.03	40.1	+2.6	50.5	29.8	19.40	+ 3.55	32.9
Calgary, Alberta	26.35	29.91	—.08	39.2	+2.0	50.9	27.4	22.31	+ 9.03	71.6
Banff, Alberta	25.31	30.01	.....	36.5	+1.8	47.2	25.9	19.25	— 1.50	77.1
Edmonton, Alberta	27.60	29.92	—.06	39.0	+3.4	49.7	28.4	27.53	+13.72	61.4
Prince Albert, Sask	28.37	29.95	—.03	34.1	+3.6	45.2	23.0	18.06	+ 4.69	48.6
Battleford, Sask	28.21	29.98	.00	35.7	+3.0	46.6	24.8	16.57	+ 3.96	31.2
Kamloops, B. C	28.71	29.99	—.01	48.0	+0.9	58.4	37.8	9.04	— 2.04	22.0
Victoria, B. C	29.94	30.04	+.03	49.8	+1.3	55.4	44.3	26.13	— 7.88	7.0
Barkerville, B. C	25.59	29.94	.. ....	36.6	+0.4	47.6	26.5	35.75	+ 3.22	174.0
Hamilton, Bermuda	29.87	30.03	—.03	70.4	+0.7	75.9	64.9	62.67	— 0.63	0.0

* Reduced to standard gravity. † For the snow year, July 1, 1900, to June 30, 1901.

TABLE III.—*Reduction data for* 1901.

Stations.	Elevation.	Mean observed pressure.	Mean observed temperature.	Mean dew-point.	Mean reduction temperature.	Mean pressure reduced to sea level.	Mean temperature reduced to sea level.	Mean pressure at 10,000 feet altitude.
1	2	3	4	5	6	7	8	9
New England.	*Feet.*	*Inches.*	° *F.*	° *F.*	° *F.*	*Inches.*	° *F.*	*Inches.*
Eastport, Me	76	29.86	42.3	36	42.4	29.95	42.5	20.49
Portland, Me	103	29.83	45.2	36	45.3	29.93	45.4	20.52
Northfield, Vt	876	29.03	41.6	34	43.5	29.99	44.4	20.53
Boston, Mass	125	29.84	49.0	40	49.1	29.98	49.2	20.62
Nantucket, Mass	12	29.96	48.6	42	48.6	29.97	48.6	20.61
Block Island, R. I	36	29.95	48.2	42	48.2	29.98	48.2	20.61
New Haven, Conn	106	29.87	49.1	40	49.2	29.98	49.3	20.62
Middle Atlantic.								
Albany, N. Y	97	29.89	48.5	39	48.6	30.00	48.7	20.63
New York, N. Y	314	29.66	52.3	41	52.6	30.00	52.9	20.69
Philadelphia, Pa	117	29.89	53.8	43	53.9	30.01	54.0	20.71
Atlantic City, N. J	52	29.95	51.4	45	51.9	30.01	52.0	20.69
Baltimore, Md	123	29.88	54.4	44	54.5	30.01	54.6	20.73
Washington, D. C	112	29.90	54.1	44	54.2	30.02	54.4	20.73
Lynchburg, Va	681	29.28	55.7	44	56.4	30.01	57.1	20.73
Norfolk, Va	91	29.93	58.5	49	58.6	30.03	58.7	20.81
South Atlantic.								
Charlotte, N. C	773	29.21	58.6	46	59.4	30.03	60.2	20.83
Raleigh, N. C	376	29.65	58.7	48	59.1	30.05	59.5	20.83
Wilmington, N. C	78	29.96	61.4	52	61.5	30.05	61.6	20.87
Charleston, S. C	48	30.00	64.2	54	64.3	30.05	64.4	20.92
Augusta, Ga	180	29.84	62.2	51	62.4	30.03	62.6	20.87
Savannah, Ga	65	29.97	65.0	54	65.1	30.03	65.2	20.91
Jacksonville, Fla	43	29.99	67.0	57	67.0	30.04	67.0	20.95
Florida Peninsula.								
Jupiter, Fla	28	29.98	72.6	64	72.6	30.01	72.6	21.01
Key West, Fla	22	29.99	74.7	66	74.7	30.01	74.7	21.05
Tampa, Fla	34	29.99	70.0	60	70.0	30.03	70.0	20.99
East Gulf.								
Atlanta, Ga	1,174	28.81	59.4	47	60.5	30.05	61.6	20.85
Mobile, Ala	57	29.98	65.4	54	65.5	30.04	65.6	20.93
Montgomery, Ala	223	29.81	63.7	51	63.9	30.05	64.1	20.91
Vicksburg, Miss	247	29.76	64.6	52	64.9	30.03	65.2	20.91
New Orleans, La	51	29.98	68.2	57	68.3	30.04	68.4	20.97
West Gulf.								
Shreveport, La	249	29.77	65.1	53	65.3	30.03	65.5	20.92
Fort Smith, Ark	457	29.53	62.0	49	62.5	30.02	63.0	20.87
Little Rock, Ark	357	29.66	61.9	49	62.2	30.05	62.5	20.88
Corpus Christi, Tex	18	29.98	70.7	62	71.6	30.00	71.6	20.99
Galveston, Tex	54	29.94	69.2	62	69.2	29.99	69.2	20.95
Palestine, Tex	510	29.48	65.7	54	66.2	30.02	66.7	20.92
San Antonio, Tex	701	29.26	69.4	53	70.1	29.99	70.8	20.97

TABLE III.—*Reduction data for* 1901—Continued.

Stations.	Elevation.	Mean observed pressure.	Mean observed temperature.	Mean dew-point.	Mean reduction temperature.	Mean pressure reduced to sea level.	Mean temperature reduced to sea level.	Mean pressure at 10,000 feet altitude.
1	2	3	4	5	6	7	8	9
Ohio Valley and Tennessee.	*Feet.*	*Inches.*	° *F.*	° *F.*	° *F.*	*Inches.*	° *F.*	*Inches.*
Chattanooga, Tenn	762	29.26	58.4	45	59.2	30.07	60.0	20.84
Knoxville, Tenn	1,004	28.99	56.2	45	57.2	30.06	58.2	20.81
Memphis, Tenn	397	29.63	61.4	49	61.8	30.06	62.2	20.88
Nashville, Tenn	546	29.48	58.0	45	58.5	30.07	59.0	20.84
Louisville, Ky	525	29.47	56.2	44	56.7	30.04	57.2	20.79
Indianapolis, Ind	822	29.15	52.0	41	52.8	30.04	53.6	20.72
Cincinnati, Ohio	628	29.36	54.0	42	54.6	30.04	55.2	20.75
Columbus, Ohio	824	29.15	51.8	41	52.6	30.04	53.4	20.72
Pittsburg, Pa	842	29.11	52.6	41	53.4	30.02	54.2	20.72
Parkersburg, W. Va	638	29.37	53.0	44	53.6	30.06	54.2	20.75
Lower Lakes.								
Buffalo, N. Y	767	29.16	47.6	39	48.3	29.99	49.0	20.61
Oswego, N. Y	335	29.61	46.0	38	46.3	29.98	46.6	20.57
Rochester, N. Y	523	29.42	47.1	39	47.6	29.99	48.1	20.60
Erie, Pa	713	29.23	48.2	41	48.9	30.00	49.6	20.63
Cleveland, Ohio	762	29.19	48.7	39	49.4	30.01	50.1	20.65
Sandusky, Ohio	629	29.33	49.3	40	49.9	30.01	50.5	20.66
Toledo, Ohio	628	29.34	48.9	39	49.6	30.02	50.4	20.66
Detroit, Mich	730	29.21	48.0	39	48.7	30.00	49.4	20.63
Upper Lakes.								
Alpena, Mich	609	29.33	42.5	36	43.1	30.01	43.7	20.55
Escanaba, Mich	612	29.33	41.3	36	41.9	30.01	42.5	20.53
Grand Haven, Mich	632	29.31	46.4	40	47.0	30.00	47.6	20.60
Marquette, Mich	734	29.20	41.7	35	42.4	30.01	43.1	20.53
Port Huron, Mich	638	29.33	46.2	38	46.8	30.03	47.4	20.62
Sault Ste. Marie, Mich	614	29.30	40.6	34	41.2	29.98	41.8	20.48
Chicago, Ill	823	29.13	48.0	40	48.8	30.02	49.6	20.64
Milwaukee, Wis	681	29.28	46.7	38	47.4	30.02	48.1	20.62
Green Bay, Wis	617	29.34	44.3	35	44.9	30.02	45.5	20.58
Duluth, Minn	702	29.24	40.0	31	40.7	30.01	41.4	20.51
North Dakota.								
Moorhead, Minn	935	28.99	41.5	34	42.4	30.02	43.3	20.54
Bismarck, N. Dak	1,674	28.22	43.0	31	44.4	30.02	47.5	20.58
Williston, N. Dak	1,875	27.98	41.6	32	42.6	30.00	44.5	20.53
Upper Mississippi Valley.								
St. Paul, Minn	837	29.09	45.6	35	46.4	30.01	47.3	20.60
Davenport, Iowa	606	29.35	50.2	39	50.8	30.01	51.4	20.67
Des Moines, Iowa	861	29.10	50.6	40	51.5	30.04	52.4	20.70
Dubuque, Iowa	698	29.26	48.6	37	49.3	30.03	50.0	20.66
Keokuk, Iowa	614	29.35	52.8	41	53.4	30.01	54.0	20.71
Cairo, Ill	356	29.66	57.6	46	58.0	30.05	58.4	20.82
Springfield, Ill	644	29.34	52.7	40	53.3	30.04	53.9	20.73
St. Louis, Mo	567	29.42	57.4	43	58.0	30.03	58.6	20.80
Missouri Valley.								
Kansas City, Mo	963	29.01	55.9	41	56.9	30.04	57.9	20.79
Springfield, Mo	1,324	28.63	56.7	43	58.0	30.03	59.3	20.80
Lincoln, Nebr	1,189	28.72	52.3	39	54.0	30.00	55.2	20.72
Omaha, Nebr	1,105	28.82	52.1	40	53.2	30.00	54.3	20.70
Valentine, Nebr	2,598	27.25	48.2	34	50.8	29.96	53.4	20.64
Pierre, S. Dak	1,572	28.32	49.4	33	49.5	30.00	51.0	20.64
Huron, S. Dak	1,306	28.60	46.2	34	48.8	30.01	50.1	20.63
Northern Slope.								
Havre, Mont	2,505	27.32	44.2	34	46.1	29.97	48.6	20.57
Miles City, Mont	2,371	27.44	47.9	40	48.8	29.93	51.2	20.59
Helena, Mont	4,110	25.79	45.2	29	49.2	29.99	53.3	20.63
Kalispell, Idaho	2,965	26.92	43.3	32	46.3	30.03	49.3	20.61
Rapid City, S. Dak	3,234	26.59	48.1	34	49.1	29.94	52.4	20.60
Cheyenne, Wyo	6,088	23.99	45.6	28	50.9	29.97	57.0	20.65
Lander, Wyo	5,372	24.63	44.2	29	49.2	29.99	54.6	20.63
North Platte, Nebr	2,821	27.08	50.5	37	53.2	30.02	56.0	20.72
Middle Slope.								
Denver, Colo	5,291	24.71	51.6	31	54.8	29.94	60.1	20.69
Pueblo, Colo	4,685	25.27	52.0	31	55.3	29.95	60.0	20.70
Concordia, Kans	1,398	28.53	54.3	42	56.2	30.01	57.6	20.75
Dodge, Kans	2,509	27.38	55.6	40	58.4	29.96	60.9	20.76
Wichita, Kans	1,358	28.59	57.3	41	59.0	30.01	60.4	20.80
Oklahoma, Okla	1,214	28.72	60.3	44	61.2	30.00	62.4	20.88
Southern Slope.								
Abilene, Tex	1,738	28.18	65.0	46	65.8	29.97	67.5	20.88
Amarillo, Tex	3,676	26.24	56.1	38	59.5	29.93	63.2	20.76
Southern Plateau.								
El Paso, Tex	3,762	26.16	64.2	38	66.4	29.89	70.2	20.84
Santa Fe, N. Mex	7,013	23.27	49.9	30	57.2	29.97	64.2	20.74
Flagstaff, Ariz	6,907	23.34	46.8	...	58.7	29.94	65.6	20.75
Phoenix, Ariz	1,108	28.73	70.6	38	70.0	29.87	71.1	20.88
Yuma, Ariz	141	29.71	72.2	41	70.9	29.85	71.0	20.89
Independence, Cal	3,910	25.96	58.7	26	62.6	29.86	65.1	20.76
Middle Plateau.								
Carson City, Nev	4,720	25.27	49.9	33	54.6	30.00	60.7	20.73
Winnemucca, Nev	4,344	25.63	48.6	28	54.6	30.00	60.1	20.72
Salt Lake City, Utah	4,366	25.61	53.3	31	55.3	29.99	61.6	20.73
Grand Junction, Colo	4,608	25.36	54.1	28	58.7	29.95	63.3	20.75
Northern Slope.								
Baker City, Oreg	3,471	26.45	46.8	30	50.2	30.03	53.7	20.68
Boise, Idaho	2,739	27.17	52.5	33	54.2	30.01	57.2	20.73
Pocatello, Idaho	4,482	25.47	49.2	32	53.7	29.99	58.2	20.70
Spokane, Wash.	1,943	27.97	48.9	35	50.4	30.03	52.3	20.68
Walla Walla, Wash.	1,000	28.96	53.3	44	51.7	30.04	52.7	20.70
North Pacific Coast.								
Neah Bay, Wash	50	29.97	48.2	44	48.4	30.03	48.6	20.65
Seattle, Wash	123	29.93	52 0	43	52.1	30.06	52.2	20.72
Portland, Oreg	154	29.90	52.6	44	52.8	30.06	53.0	20.73
Roseburg, Oreg	518	29.48	52.8	43	53.3	30.05	53.8	20.74
Middle Pacific Coast.								
Eureka, Cal	62	30.00	51.8	46	54.0	30.06	54.1	20.76
Red Bluff, Cal	332	29.62	63.1	42	56.9	29.97	57.2	20.74
Sacramento, Cal	69	29.90	60.1	46	60.1	29.98	59.3	20.80
San Francisco, Cal	155	29.87	55.2	48	55.4	30.03	55.6	20.76

TABLE III.—*Reduction data for* 1901.—Continued.

Stations.	Elevation.	Mean observed pressure.	Mean observed temperature.	Mean dew-point.	Mean reduction temperature.	Mean pressure reduced to sea level.	Mean temperature reduced to sea level.	Mean pressure at 10,000 feet altitude.
1	2	3	4	5	6	7	8	9
South Pacific Coast.	*Feet.*	*Inches.*	° *F.*	° *F.*	° *F.*	*Inches.*	° *F.*	*Inches.*
Fresno, Cal.	330	29.61	63.5	42	61.3	29.96	61.6	20.80
Los Angeles, Cal.	338	29.60	62.1	49	62.1	29.95	62.4	20.81
San Diego, Cal.	87	29.86	61.2	51	63.7	29.96	63.8	20.85
San Luis Obispo, Cal.	201	29.80	59.1	46	59.3	30.02	59.5	20.82
Canadian Stations.								
St. Johns, N F.	125	29.71	42.5	...	42.6	29.86	42.7	20.43
Sydney, C. B. I.	35	29.88	44.6	....	44.7	29.92	44.8	20.51
Halifax, N. S.	97	29.83	46.2	....	46.3	29.94	46.4	20.55
Grand Manan, N. B.	49	29.88	43.9	....	43.9	29.93	43.9	20.50
Yarmouth, N. S.	65	29.88	44.8	....	44.9	29.96	45.0	20.54
Charlottetown, P. E I.	38	29.87	44.5	....	44.5	29.91	44.5	20.50
Chatham, N. B.	21	29.90	41.9	....	41.9	29.92	41.9	20.46
Father Point, Que.	20	29.88	36.4	....	36.4	29.91	36.4	20.37
Quebec, Que.	296	29.61	40.3	....	40.6	29.95	40.9	20.46
Montreal, Que.	187	29.75	43.0	....	43.2	29.96	43.4	20.51
Bissett, Ont.	557	29.38	38.6	....	39.1	30.00	39.6	20.48
Ottawa, Ont.	294	29.66	42.8	....	43.1	29.98	43.4	20.52
Kingston, Ont.	285	29.66	44.4	....	44.7	29.98	45.0	20.55
Toronto, Ont.	350	29.61	46.0	....	46.4	29.99	46.7	20.58
White River, Ont.	1,252	28.65	33.2	....	35.6	30.03	36.9	20.44
Port Stanley, Ont.	592	29.36	45.6	....	46.2	30.00	46.8	20.59
Saugeen, Ont.	656	29.27	44.2	....	44.9	30.00	45.6	20.57
Parry Sound, Ont.	635	29.28	42.2	....	42.8	29.99	43.4	20.52
Port Arthur, Ont.	644	29.29	36.1	....	36.1	30.00	36.7	20.42
Winnipeg, Man.	760	29.20	36.3	....	37.1	30.05	37.9	20.47
Minnedosa, Man.	1,690	28.16	36.3	....	38.8	30.01	40.5	20.47
Qu'Appelle, Assin.	2,115	27.68	36.3	....	38.6	29.98	40.7	20.45
Medicine Hat, Assin.	2,161	27.66	42.9	....	44.5	29.97	46.7	20.54
Swift Current, Assin.	2,440	27.37	40.1	....	41.8	29.98	44.2	20.50
Calgary, Alberta	2,389	26.35	39.2	....	42.6	29.91	46.0	20.46
Banff, Alberta	4,542	25.31	36.5	....	40.7	30.01	45.8	20.51
Edmonton, Alberta	2,158	27.60	39.0	....	42.1	29.92	44.3	20.46
Prince Albert, Sask.	1,432	28.37	34.1	....	36.4	29.95	37.8	20.39
Battleford, Sask.	1,620	28.21	35.7	....	37.5	29.98	39.1	20.43
Kamloops, B. C.	1,193	28.71	48.0	....	46.7	29.99	47.9	20.59
Victoria, B. C.	85	29.94	49.8	....	49.8	30.04	49.8	20.68
Barkerville, B. C.	4,180	25.59	36 6	....	39 2	29.94	43.4	20.44
Hamilton, Bermuda	151	29.87	70.4	....	70.6	30.03	70.8	21.00

TABLE IV.—*Resultant winds from observations at* 8 *a. m. and* 8 *p. m., daily, during the year* 1901.

Stations.	Component direction from—				Resultant.	
	N.	S.	E.	W.	Direction from—	Duration.
New England.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	°	*Hours.*
Eastport, Me.	353	177	135	315	n. 43 w.	248
Portland, Me.	261	220	107	308	n. 79 w.	204
Northfield, Vt.	291	368	62	74	s. 9 w.	76
Boston, Mass.	225	187	142	335	n. 78 w.	194
Nantucket, Mass.	231	231	164	290	w.	126
Block Island, R. I.	227	188	193	317	n 79 w.	214
New Haven Conn	295	210	115	266	n. 62 w.	170
Middle Atlantic States.						
Albany, N. Y.	375	272	77	212	n. 11 w.	204
Binghamton, N. Y †	123	49	137	124	n. 10 e.	75
New York, N. Y.	265	192	173	295	n. 60 w.	139
Harrisburg, Pa †	117	54	108	153	n. 34 w.	7
Philadelphia, Pa	272	197	172	275	n. 52 w.	129
Scranton, Pa	294	191	183	255	n. 35 w.	122
Atlantic City, N. J.	254	196	157	305	n 74 w.	208
Cape May, N. J.	260	216	161	246	n. 61 w.	96
Baltimore, Md.	218	179	211	269	n. 56 w.	72
Washington, D. C.	287	220	167	212	n. 30 w.	81
Lynchburg, Va.	219	202	188	305	n. 81 w.	122
Norfolk, Va.	245	289	185	183	s. 3 e.	44
Richmond, Va.	278	251	159	192	n. 50 w.	43
South Atlantic States.						
Charlotte, N. C.	227	271	216	182	s. 29 w.	50
Raleigh, N. C.	273	234	113	267	n. 72 w.	158
Wilmington, N. C.	214	247	159	263	s. 73 w.	104
Charleston, S. C.	233	232	152	235	n. 89 w.	93
Columbia, S. C.	261	207	208	248	n. 41 w.	68
Augusta, Ga.	240	197	158	397	n. 74 w.	146
Savannah, Ga.	222	229	147	222	s. 85 w.	84
Jacksonville, Fla.	243	210	225	231	n. 10 w.	34
Florida Peninsula.						
Jupiter, Fla.	196	207	267	239	s. 68 e.	30
Key West, Fla	288	144	404	69	n. 68 e.	37
Tampa, Fla	301	139	237	203	n. 11 e.	163
Eastern Gulf States.						
Atlanta, Ga.	237	189	201	294	n. 31 w.	175
Macon, Ga †	156	99	71	110	n. 34 w.	72
Pensacola, Fla †.	204	52	115	84	n. 11 e.	153
Mobile, Ala	336	226	125	191	n. 32 w.	13
Montgomery, Ala	230	203	219	216	n. 6 e.	27
Meridian, Miss †	146	90	96	119	n. 23 w.	60
Vicksburg, Miss.	223	228	288	151	s. 88 e.	135
New Orleans, La.	251	257	238	169	s. 85 e.	69

TABLE IV.—*Resultant winds*—Continued.

Stations.	Component direction from—				Resultant.	
	N.	S.	E.	W.	Direction from—	Duration.
Western Gulf States.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	°	*Hours.*
Shreveport, La.	184	353	382	162	s. 52 e.	278
Fort Smith, Ark.	202	164	333	167	n. 77 e.	175
Little Rock, Ark	223	260	191	241	s. 53 w.	62
Corpus Christi, Tex.	183	331	313	80	n. 78 e.	245
Fort Worth, Tex	180	338	219	150	s. 24 e.	175
Galveston, Tex	184	317	309	108	s. 59 e.	247
Palestine, Tex	207	328	213	128	s. 34 e.	144
San Antonio, Tex	214	262	372	61	s. 81 e.	314
Ohio Valley and Tennessee.						
Chattanooga, Tenn.	231	235	168	288	s. 88 w.	30
Knoxville, Tenn	290	196	166	258	n. 45 w.	127
Memphis, Tenn	245	251	194	204	s. 59 w.	12
Nashville, Tenn.	267	223	153	259	n. 68 w.	58
Lexington, Ky †.	87	160	107	122	s. 16 w.	73
Louisville, Ky.	233	246	170	228	s. 78 w.	59
Evansville, Ind †.	131	118	103	94	n. 35 e.	16
Indianapolis, Ind.	253	231	150	257	n. 80 w.	112
Cincinnati, Ohio	215	227	224	251	s. 66 w.	30
Columbus, Ohio	182	233	207	269	s. 50 w.	78
Pittsburg, Pa	277	193	123	338	n. 70 w.	234
Parkersburg, W. Va	231	238	144	257	s. 87 w.	112
Elkins, W. Va.	235	207	92	317	n. 82 w.	222
Lower Lake Region.						
Buffalo, N. Y.	146	239	161	328	s. 62 w.	192
Oswego, N. Y.	186	312	171	231	s. 25 w.	140
Rochester, N. Y.	144	278	134	257	s. 43 w.	177
Erie, Pa.	189	224	130	322	s. 78 w.	194
Cleveland, Ohio.	195	306	193	218	s. 12 w.	122
Sandusky, Ohio	170	233	189	296	s. 61 w.	125
Toledo, Ohio	184	235	170	296	s. 69 w.	139
Detroit, Mich.	230	221	156	290	n. 86 w.	135
Upper Lake Region.						
Alpena, Mich.	228	188	157	301	n. 78 w.	194
Escanaba, Mich	396	223	95	259	n. 43 w.	283
Grand Haven, Mich.	235	216	194	251	n. 70 w.	60
Houghton, Mich. †	107	56	138	136	n. 2 e.	51
Marquette, Mich	243	186	113	366	n. 77 w.	257
Port Huron, Mich	245	226	136	289	n. 82 w.	151
Sault Ste. Marie, Mich.	192	169	276	251	n. 47 e.	34
Chicago, Ill.	242	215	204	241	n. 54 w.	26
Milwaukee, Wis.	255	78	166	281	n. 6 w.	181
Green Bay, Wis	251	261	132	229	s. 84 w.	100
Duluth, Minn	392	117	223	304	n. 24 w.	197
North Dakota.						
Moorhead, Minn	260	242	237	131	n. 82 e.	101
Bismarck, N. Dak.	280	140	254	228	n. 12 e.	143
Williston, N. Dak	263	214	153	229	n. 58 w.	94
Upper Mississippi Valley.						
St. Paul, Minn	257	237	184	232	n. 67 w.	52
LaCrosse, Wis †	120	166	58	85	s. 30 w.	53
Davenport, Iowa	173	188	241	267	s. 60 w.	30
Des Moines, Iowa	256	220	213	218	n. 8 w.	36
Dubuque, Iowa	213	247	208	253	s. 53 w.	56
Keokuk, Iowa	225	244	199	249	s. 69 w.	54
Cairo, Ill.	236	278	180	203	s. 29 w.	48
Springfield, Ill.	228	241	186	247	s. 79 w.	62
Hannibal, Mo †.	107	113	97	127	s. 79 w.	31
St. Louis, Mo.	216	252	181	201	s. 28 w.	42
Missouri Valley.						
Columbia, Mo*	110	111	108	108	s.	1
Kansas City, Mo	253	269	180	185	s. 17 w.	17
Springfield, Mo.	208	293	203	189	s. 9 e.	86
Lincoln, Nebr	248	280	224	139	s. 69 e.	90
Omaha, Nebr.	251	260	221	188	s. 75 w.	34
Valentine, Nebr.	241	223	150	259	n. 80 w.	112
Sioux City, Iowa †.	134	126	110	90	n. 68 e.	22
Pierre, S. Dak.	232	212	286	160	n. 81 e.	132
Huron, S. Dak.	241	215	263	224	n. 56 e.	47
Northern Slope.						
Havre, Mont	194	185	190	360	n. 87 w.	170
Miles City, Mont	251	216	169	220	n. 55 w.	62
Helena, Mont.	135	281	65	445	s. 69 w.	409
Kalispell, Mont	136	196	137	407	s. 78 w.	277
Rapid City, S. Dak.	241	157	268	317	n. 30 w.	96
Cheyenne, Wyo	116	206	82	322	s. 69 w.	258
Lander, Wyo.	169	251	143	330	s. 60 w.	161
North Platte, Nebr	165	244	222	279	s. 35 w.	98
Middle Slope.						
Denver, Colo.	205	322	179	234	s. 37 w.	100
Pueblo, Colo	257	151	217	279	n. 34 w.	62
Concordia, Kans.	194	310	186	151	s. 18 e.	126
Dodge, Kans.	236	218	259	188	n. 79 e.	74
Wichita, Kans.	233	350	178	88	s. 87 e.	150
Oklahoma, Okla.	224	331	186	97	s. 86 w.	91
Southern Slope.						
Abilene, Tex.	171	454	261	127	s. 21 e.	364
Amarillo, Tex.	162	373	199	213	s. 3 w.	210
Southern Plateau.						
El Paso, Tex.	243	91	259	312	n. 18 w.	158
Santa Fe, N. Mex	233	234	303	126	s. 88 e.	175
Flagstaff, Ariz	215	184	141	349	n. 82 w.	212
Phoenix, Ariz.	163	130	330	227	n. 59 e.	118
Yuma, Ariz.	226	216	172	245	n. 82 w.	73
Independence, Cal.	305	220	111	276	n. 63 w.	179
Middle Plateau.						
Carson City, Nev.	171	231	108	355	s. 68 w.	162
Winnemucca, Nev	222	199	187	293	n. 80 w.	112
Modena, Utah	140	185	131	421	s. 82 w.	293
Salt Lake City, Utah.	233	240	248	190	s. 82 e.	59
Grand Junction, Colo.	191	216	272	236	s. 55 e.	44
Northern Plateau.						
Baker City, Oreg.	223	346	156	179	s. 11 w.	125
Boise, Idaho	233	201	185	302	n. 78 w.	152
Lewiston, Idaho †	30	84	234	55	s. 56 e.	96

TABLE IV.—*Resultant winds*—Continued.

Stations.	Component direction from— N.	S.	E.	W.	Resultant. Direction from—	Duration.
Northern Plateau—Cont'd.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	°	*Hours.*
Pocatello, Idaho	96	334	171	284	s. 25 w.	262
Spokane, Wash	150	324	211	193	s. 6 e.	392
Walla Walla, Wash	78	477	80	184	s. 14 w.	412
North Pacific Coast Region.						
Neah Bay, Wash	42	211	246	352	s. 33 w.	302
Port Crescent, Wash*	9	76	122	204	s. 49 w.	106
Seattle, Wash	182	307	240	160	s. 34 e.	144
Tacoma, Wash	233	297	87	245	s. 69 w.	171
Portland, Oreg	230	259	128	300	s. 80 w.	173
Roseburg, Oreg	308	139	149	257	n. 33 w.	302
Middle Pacific Coast Region.						
Eureka, Cal	265	223	143	292	n. 75 w.	135
Mount Tamalpais, Cal	312	107	97	300	n. 42 w.	297
Red Bluff, Cal	256	223	199	100	n. 72 e.	104
Sacramento, Cal	191	364	282	167	s. 35 e.	308
San Francisco, Cal	114	200	56	487	s. 78 w.	439
South Pacific Coast Region.						
Fresno, Cal	363	70	116	401	n. 44 w.	403
Los Angeles, Cal	168	117	158	404	n. 82 w.	354
San Diego, Cal	310	127	140	243	n. 29 w.	206
San Luis Obispo, Cal	209	138	27	298	n. 59 w.	314
West Indies.						
Basseterre, St. Kitts Island	218	68	540	25	n. 74 e.	540
Bridgetown, Barbados	237	136	590	11	n. 80 e.	594
Havana, Cuba	219	100	467	61	n. 74 e.	427
Kingston, Jamaica	557	36	253	36	n. 25 e.	564
Port of Spain, Trinidad	142	123	532	42	n. 88 e.	490
Puerto Principe, Cuba	335	83	434	60	n. 56 e.	447
Roseau, Dominica, W. I	234	117	474	63	n. 72 e.	427
San Juan, Porto Rico	63	295	474	46	s. 68 e.	462
Santiago de Cuba, Cuba	390	180	254	67	n. 42 e.	283
Willemstad, Curaçao	68	62	634	11	e.	615

* From observations at 8 p. m. only. † From observations at 8 a. m. only.

TABLE V.—*Total number of days with thunderstorms at selected stations*, 1901.

State and station.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November	December.	Annual.
Alabama.													
Mobile	0	1	6	6	8	7	11	11	1	1	1	2	55
Montgomery	0	2	5	1	6	9	13	13	4	1	1	3	58
Scottsboro	0	1	4	2	9	15	12	15	3	0	0	1	62
Arizona.													
Flagstaff	0	0	0	0	0	0	0	9	0	1	0	0	10
Fort Defiance	0	0	0	1	2	1	1	0	0	0	0	0	5
Phoenix	0	2	2	0	2	0	4	9	0	1	1	0	21
Showlow	0	0	0	2	4	0	0	7	0	4	0	0	17
Yuma	0	0	0	0	0	0	0	2	0	0	0	0	2
Arkansas.													
Fort Smith	0	0	3	8	11	6	12	8	3	3	5	1	60
Keesees Ferry	1	1	5	7	6	1	12	8	2	2	5	3	51
Little Rock	0	1	4	2	4	4	13	6	3	0	3	3	43
Pocahontas	2	1	0	4	4	5	8	4	0	0	0	0	28
California.													
Eureka	0	1	1	0	1	0	0	0	0	0	0	0	3
Fresno	0	0	0	0	1	0	0	0	0	0	0	0	1
Independence	0	0	0	0	1	0	3	9	0	1	1	0	15
Los Angeles	0	0	0	0	1	0	0	0	0	0	0	0	1
Mount Tamalpais	0	0	0	0	0	0	0	0	0	0	0	0	0
Red Bluff	0	0	0	1	2	0	0	0	0	1	0	0	4
Sacramento	0	1	0	0	0	0	0	1	0	0	0	0	2
San Diego	0	1	1	1	0	0	0	0	0	0	0	0	3
San Francisco	0	0	0	1	0	0	0	0	0	0	0	0	1
San Luis Obispo	0	0	0	0	0	0	0	0	0	0	0	0	0
Colorado.													
Denver	0	0	0	1	10	10	12	15	6	2	0	0	56
Durango	0	0	0	0	4	0	4	0	1	1	0	0	10
Fort Collins	0	0	0	0	8	0	6	0	0	0	0	0	14
Grand Junction	0	0	1	5	7	2	11	17	2	1	0	0	46
Pueblo	0	0	0	3	14	4	10	19	3	2	1	0	56
Connecticut.													
Hartford	0	0	0	1	2	4	11	7	4	2	0	0	31
New Haven	0	0	2	0	3	2	10	2	3	2	0	0	24
Dist. of Columbia.													
Washington	0	0	1	0	4	6	16	6	5	0	0	0	38
Florida.													
Jacksonville	0	1	4	1	11	9	16	17	5	2	0	0	66
Jupiter	0	2	2	2	8	13	12	16	6	2	0	1	64
Key West	0	1	1	2	5	4	8	10	2	1	0	1	35
Merritt Island	0	2	5	2	13	17	18	27	21	0	0	1	106
Myers	0	2	2	3	12	29	17	31	18	4	0	0	118
Pensacola	0	0	5	4	4	3	14	9	1	0	0	3	43
Tampa	1	2	4	2	6	15	19	24	3	1	0	0	77
Georgia.													
Atlanta	0	1	2	4	8	10	16	12	0	1	0	0	54
Augusta	0	0	0	0	4	9	17	5	6	0	0	0	41
Clayton	0	0	7	3	7	20	19	16	4	1	0	0	72
Macon	0	1	6	1	10	8	12	10	4	3	0	0	55
Poulan	1	1	5	2	11	4	7	10	2	0	0	0	43
Savannah	0	0	4	1	8	7	13	15	4	1	0	0	53
Idaho.													
Boise	0	0	1	0	4	0	1	1	2	1	0	1	11
Downey	0	0	0	1	6	0	5	5	0	0	0	0	17
Lewiston	0	0	0	0	3	3	3	1	1	0	1	0	12
Murray	0	0	0	0	2	1	1	1	0	0	2	0	7
Ola	0	0	0	0	2	0	1	3	2	0	0	0	8
Pocatello	0	0	0	0	2	0	1	4	1	0	0	0	8

TABLE V.—*Total number of days with thunderstorms, etc.*—Continued.

State and station.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Illinois.													
Cairo	1	0	0	1	7	9	7	10	1	1	1	1	39
Chicago	0	0	1	0	5	13	9	5	3	1	1	0	38
Cisne	0	1	0	0	2	2	5	0	0	0	0	0	10
Peoria	0	0	2	0	6	6	6	3	1	0	0	0	24
Rantoul	0	0	1	0	4	15	6	2	3	3	1	1	36
Springfield	0	0	2	0	3	14	4	5	3	1	0	0	32
Winnebago	0	0	2	0	5	5	6	4	1	0	0	0	23
Indiana.													
Butlerville	0	1	2	0	2	6	1	4	2	0	0	1	19
Cambridge City	0	0	1	0	3	14	7	7	1	1	0	0	34
Evansville	0	1	2	1	5	7	6	4	1	1	0	0	28
Huntington	0	0	2	0	5	6	2	8	2	2	0	1	28
Indianapolis	0	0	3	0	4	14	3	5	2	1	0	0	32
Worthington	0	1	2	1	4	6	3	3	2	1	0	1	24
Iowa.													
Davenport	0	0	0	0	2	9	4	3	1	0	0	0	19
Des Moines	0	0	4	1	3	9	11	5	6	5	0	0	44
Dubuque	0	0	0	0	7	8	5	4	3	2	0	0	29
Keokuk	1	0	2	0	3	10	11	2	2	3	0	0	34
Sioux City	0	0	1	2	2	12	5	5	6	3	0	0	36
Kansas.													
Concordia	0	0	0	1	3	5	5	4	9	5	0	0	32
Dodge	0	0	0	1	8	7	10	11	6	5	0	0	48
Topeka	0	0	2	1	3	5	10	7	5	6	0	0	39
Wichita	0	0	1	4	6	7	9	6	7	4	0	0	44
Kentucky.													
Lexington	0	0	0	0	2	12	12	5	3	1	0	0	35
Louisville	0	1	2	2	4	10	7	5	2	1	0	0	34
Louisiana.													
Grand Coteau	0	2	3	3	1	5	7	4	4	0	0	1	30
New Orleans	2	0	4	3	4	7	18	13	3	2	2	4	62
Shreveport	0	2	5	5	9	6	11	5	5	0	1	3	52
Maine.													
Eastport	0	0	0	0	1	6	4	2	1	0	0	0	14
Farmington	0	0	0	0	1	4	5	1	1	0	0	0	12
Orono	0	0	0	0	0	1	2	1	0	0	0	0	4
Portland	0	0	0	0	0	2	4	2	0	0	0	0	8
Maryland.													
Baltimore	0	0	2	0	3	4	10	3	5	0	0	0	27
Grantsville	1	0	1	0	9	12	17	11	1	0	0	0	52
Princess Anne	0	0	3	1	4	1	8	6	5	0	0	0	28
Massachusetts.													
Boston	0	0	0	0	2	3	6	1	3	0	0	0	15
Monson	0	0	0	0	1	4	0	1	2	1	0	0	9
Nantucket	0	0	1	0	1	2	5	2	2	1	0	0	14
New Bedford	0	0	2	0	1	2	6	3	0	0	0	0	14
Pittsfield	0	0	0	0	0	0	1	1	0	0	0	0	2
Michigan.													
Alpena	0	0	1	0	5	8	7	7	4	1	0	0	33
Detroit	0	0	0	0	4	9	11	6	3	0	0	0	33
Escanaba	0	0	0	0	1	8	13	6	2	1	1	0	32
Grand Haven	0	0	1	0	5	8	9	4	2	1	1	0	31
Houghton	0	0	0	2	2	7	5	5	4	0	1	0	25
Lansing	0	0	1	0	4	8	11	5	3	1	1	0	34
Marquette	0	0	0	1	4	7	3	3	2	0	0	0	20
Port Huron	0	0	1	0	6	4	9	4	2	0	0	0	26
Sault Ste. Marie	0	0	0	0	3	7	6	4	3	2	1	0	26
Minnesota.													
Duluth	0	0	0	0	3	12	13	7	2	2	0	0	39
Minneapolis	0	0	1	2	4	13	9	6	5	3	1	0	44
Moo head	0	0	1	4	2	12	10	8	3	1	0	0	41
Rolling Green	0	0	1	0	1	5	4	4	2	2	0	0	19
St. Cloud	0	0	1	1	0	4	4	2	2	1	0	0	15
St. Paul	0	0	1	2	2	10	8	6	2	2	1	0	34
Mississippi.													
Biloxi	1	1	4	4	0	2	5	2	0	0	1	0	20
Meridian	1	2	3	6	6	7	5	10	1	1	1	1	44
Vicksburg	1	2	5	1	5	10	12	7	2	0	2	2	49
Water Valley	0	3	8	2	7	5	9	6	2	0	1	2	45
Missouri.													
Columbia	2	0	3	2	3	11	11	6	6	1	1	1	47
Hannibal	1	0	2	1	2	9	10	3	2	1	0	0	31
Kansas City	0	0	2	2	5	6	12	8	6	3	0	0	44
St. Louis	1	0	2	1	4	7	4	1	2	3	0	1	26
Springfield	0	0	4	3	3	5	7	5	5	1	2	2	37
Montana.													
Havre	0	0	0	1	4	4	10	1	4	0	0	0	24
Helena	1	0	0	0	9	4	10	3	4	1	1	0	33
Kalispell	0	0	0	0	2	2	1	0	3	0	0	0	8
Miles City	0	0	0	0	7	9	7	3	2	0	0	0	28
Ovando	0	0	0	0	2	2	2	0	2	0	1	0	9
Parrot	0	1	0	2	4	2	6	2	3	0	0	0	20
Nebraska.													
Lincoln	0	0	0	1	3	11	8	9	9	6	0	0	47
North Platte	0	0	0	0	4	9	4	7	9	1	0	0	34
Omaha	0	0	0	2	2	13	9	3	9	7	0	0	45
Valentine	0	0	0	1	3	17	11	12	7	0	0	0	51
Nevada.													
Carson City	0	0	0	0	0	2	3	1	4	0	1	0	11
Tybo	0	0	0	0	3	0	4	12	2	0	1	0	22
Winnemucca	0	1	0	0	2	1	0	7	0	2	0	0	13
New Hampshire.													
Bethlehem	0	0	0	0	1	3	3	1	1	0	0	0	9
Nashua	0	0	0	0	1	2	3	2	2	1	0	0	11
New Jersey.													
Atlantic City	0	0	2	0	6	0	8	2	3	0	0	0	21
Cape May	0	0	2	0	3	0	0	0	0	0	0	0	5
Somerville	0	0	1	0	6	2	10	5	1	1	0	0	26
New Mexico.													
Roswell	0	1	0	3	5	4	12	3	0	0	0	0	28
Santa Fe	0	0	0	4	14	7	25	19	7	3	0	0	79
New York.													
Albany	0	0	0	0	4	6	12	5	2	1	0	0	30

TABLE V.—*Total number of days with thunderstorms, etc.*—Continued.

State and station	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
New York—Cont'd													
Binghamton	0	0	0	0	5	7	9	9	3	1	0	0	34
Buffalo	0	0	0	0	3	7	5	9	1	1	0	0	26
New York	0	0	0	0	3	4	13	8	3	1	0	0	32
Oswego	0	0	0	1	3	7	6	7	4	4	0	0	32
Rochester	0	0	1	1	3	6	7	10	1	1	0	0	30
South Canisteo	0	0	0	0	3	11	9	10	2	2	0	0	37
North Carolina.													
Abshers	1	0	2	0	13	17	21	16	6	2	0	1	79
Charlotte	0	0	3	1	9	11	12	15	2	0	0	0	53
Hatteras	1	0	2	2	4	2	4	2	2	0	0	3	22
Raleigh	0	0	3	1	12	7	12	14	3	0	0	0	52
Wilmington	0	0	4	3	11	5	9	6	2	1	1	1	43
North Dakota.													
Bismarck	0	0	0	2	0	7	11	3	4	0	0	0	27
Dickinson	0	0	1	1	0	9	2	0	1	0	0	0	14
Williston	0	0	0	1	4	4	7	3	4	0	0	0	24
Ohio.													
Cincinnati	0	1	2	0	4	13	10	5	0	0	0	0	35
Cleveland	0	0	2	0	8	11	10	10	2	1	1	0	45
Columbus	0	1	2	0	8	13	10	6	2	0	0	0	42
Sandusky	0	0	1	0	4	9	10	7	1	3	0	0	35
Toledo	0	0	1	0	3	7	10	5	2	1	0	1	30
Oklahoma.													
Beaver	0	0	1	5	0	0	3	1	0	0	0	0	10
Oklahoma	0	1	3	4	11	6	3	7	2	2	2	2	43
Oregon.													
Astoria	1	0	1	0	0	0	0	0	0	0	1	0	3
Baker City	0	0	0	0	2	4	0	1	1	0	0	0	8
Portland	0	0	0	0	1	0	0	2	0	0	0	0	3
Roseburg	0	0	0	1	0	0	0	3	0	0	0	0	4
Pennsylvania.													
Erie	0	0	1	0	2	4	3	9	2	2	0	0	23
Harrisburg	0	0	1	0	5	5	10	4	4	1	0	0	30
Philadelphia	0	0	2	0	7	3	13	5	5	0	0	0	35
Pittsburg	0	0	0	0	6	13	12	9	3	0	0	0	43
Scranton	0	0	1	0	4	5	8	6	3	0	0	0	27
Wellsboro	0	0	0	0	3	8	6	5	3	0	0	0	25
Rhode Island.													
Block Island	0	0	1	0	2	1	5	3	1	0	0	0	13
Narragansett	0	0	1	0	1	2	6	1	2	0	0	0	13
South Carolina.													
Charleston	0	0	3	3	8	9	11	10	2	2	0	0	48
Columbia	0	0	3	0	10	9	9	12	2	1	0	0	46
South Dakota.													
Huron	0	0	0	1	3	17	11	7	6	0	0	0	45
Pierre	0	0	1	1	4	15	15	9	4	1	0	0	50
Rapid City	0	0	0	0	2	14	9	15	3	1	0	0	44
Tennessee.													
Chattanooga	0	0	5	2	9	13	17	12	5	1	0	1	65
Knoxville	0	0	3	0	6	10	5	10	4	0	0	1	39
Memphis	1	2	4	2	6	5	4	8	2	0	0	1	35
Nashville	1	0	2	1	3	10	6	7	2	0	0	1	33
Texas.													
Abilene	0	2	3	3	11	1	8	2	4	3	2	1	40
Amarillo	0	0	0	0	0	8	12	10	0	0	0	0	30
Corpus Christi	0	0	1	2	2	3	5	2	4	0	0	1	20
El Paso	0	1	0	1	0	2	7	4	1	2	2	0	20
Fort Worth	0	1	5	4	11	4	10	3	5	2	1	2	48
Galveston	0	1	1	2	2	3	8	9	2	1	3	3	35
Palestine	1	2	4	3	8	4	8	5	4	0	4	2	45
San Antonio	0	0	2	0	5	3	2	5	5	1	0	0	23
Utah.													
Grover	0	0	0	1	1	0	0	11	0	0	0	0	13
Modena	0	0	0	0	3	1	8	12	1	2	0	1	28
Salt Lake City	1	0	0	1	3	1	7	11	1	2	1	1	29
Vermont.													
Northfield	0	0	0	0	1	8	6	1	1	0	0	0	17
Vernon	0	0	0	0	2	5	8	7	2	1	0	0	25
Virginia.													
Cape Henry	0	0	5	2	5	4	8	10	5	1	1	0	41
Dale Enterprise	0	0	3	0	7	11	12	5	4	1	0	0	43
Lynchburg	0	0	3	0	4	9	10	10	2	0	0	0	38
Norfolk	0	0	3	2	5	1	8	8	2	1	0	0	30
Richmond	0	0	3	1	6	4	12	6	4	0	0	0	36
Wytheville	0	0	4	0	10	6	4	6	0	0	0	0	30
Washington.													
Neah Bay	0	0	0	1	0	0	0	0	0	0	1	2	4
Port Crescent	0	0	0	0	0	0	1	0	0	0	0	0	1
Seattle	0	0	0	0	0	0	0	0	0	0	0	0	0
Spokane	0	0	1	0	2	2	0	1	1	0	0	0	7
Tacoma	0	0	0	1	0	0	0	0	0	0	0	0	1
Walla Walla	0	0	0	0	1	2	2	0	1	0	0	0	6
West Virginia.													
Elkins	0	0	0	0	8	16	16	10	2	1	0	0	53
Parkersburg	0	2	1	0	5	16	7	6	3	0	0	0	40
Powellton	1	0	1	0	3	9	7	4	2	1	0	0	28
Wisconsin.													
Green Bay	0	0	1	1	3	11	9	6	3	2	0	0	36
La Crosse	0	0	1	0	5	12	11	3	4	3	0	0	39
Milwaukee	0	0	0	0	4	12	11	7	2	0	0	0	36
Wyoming.													
Cheyenne	0	0	0	0	9	9	9	12	4	1	0	0	44
Fourbear	0	0	0	0	1	7	5	5	2	0	0	0	20
Lander	0	0	0	0	7	6	2	4	1	0	0	0	20

TABLE VI.—*Number of days on which thunderstorms were reported,* 1901.

States.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Alabama	6	5	14	11	19	25	26	27	11	3	5	6	158
Arizona	1	5	6	8	16	5	27	28	11	13	2	1	123
Arkansas	4	4	16	13	19	21	27	26	11	8	13	6	168
California	5	6	10	6	14	3	10	20	3	12	6	1	96
Colorado	0	0	5	19	31	24	29	30	17	8	3	1	167
Connecticut	0	0	4	2	8	13	20	15	11	3	0	0	76
Delaware	0	0	2	1	13	7	17	8	4	0	0	0	52
Dist. of Columbia	0	0	0	0	4	6	16	6	5	0	0	0	37
Florida	5	11	11	10	23	30	29	31	23	6	3	4	186
Georgia	4	3	15	7	22	23	28	31	12	3	0	4	152
Idaho	0	0	3	5	22	11	15	14	4	2	2	1	79
Illinois	2	2	16	5	18	28	21	17	10	2	3	3	127
Indiana	2	1	8	5	15	22	20	14	7	6	3	3	106
Indian Territory	1	3	5	13	17	7	13	10	5	2	9	0	85
Iowa	2	1	9	11	14	28	24	20	18	13	5	0	145
Kansas	1	4	2	16	20	21	24	27	23	21	6	8	173
Kentucky	2	2	8	4	20	21	19	17	5	4	1	2	105
Louisiana	6	11	18	12	15	22	31	30	12	4	4	9	174
Maine	0	0	1	0	4	11	11	13	7	2	0	0	49
Maryland	1	0	10	4	21	23	26	21	12	3	0	2	123
Massachusetts	0	0	4	0	9	8	22	15	8	3	0	0	69
Michigan	1	0	7	4	19	25	26	22	18	17	1	0	140
Minnesota	0	0	6	10	14	27	26	23	18	12	3	0	139
Mississippi	4	8	18	10	16	20	29	30	11	1	6	7	160
Missouri	3	2	17	19	22	29	27	26	17	18	7	4	191
Montana	1	1	3	4	23	25	17	17	16	0	2	2	111
Nebraska	2	1	2	17	15	27	28	27	22	18	2	0	161
Nevada	0	2	1	1	19	5	10	19	5	7	1	2	72
New Hampshire	0	0	0	0	4	13	14	13	8	3	0	0	55
New Jersey	0	0	4	4	14	15	25	18	14	3	0	2	99
New Mexico	2	1	4	14	21	14	29	26	13	12	2	1	139
New York	0	0	6	5	19	23	25	24	21	9	1	0	133
North Carolina	5	0	7	6	26	29	30	27	12	5	1	3	151
North Dakota	0	0	3	7	15	26	21	13	7	2	0	0	94
Ohio	1	3	10	3	19	25	25	17	11	6	5	1	126
Oklahoma	2	3	7	14	15	14	18	16	9	5	4	4	111
Oregon	3	2	8	6	14	9	8	17	9	2	6	2	86
Pennsylvania	0	0	6	2	20	25	27	23	12	5	1	1	122
Rhode Island	0	0	2	0	7	4	11	7	1	0	0	0	32
South Carolina	0	2	9	7	22	23	26	30	13	4	2	3	141
South Dakota	1	0	5	8	15	29	21	24	19	7	1	0	130
Tennessee	2	2	11	4	24	25	26	22	8	4	0	4	132
Texas	3	11	11	12	26	21	27	21	19	11	11	14	187
Utah	2	2	3	7	19	11	18	28	2	10	1	3	106
Vermont	0	0	0	0	5	12	11	10	6	3	0	0	47
Virginia	1	0	10	4	20	23	27	24	14	3	0	4	130
Washington	3	2	3	8	10	16	7	11	6	1	7	1	75
West Virginia	1	0	8	0	15	25	28	21	11	1	1	2	113
Wisconsin	0	0	4	4	16	24	23	24	21	11	1	0	128
Wyoming	0	2	1	5	23	20	19	28	9	6	0	0	113
Total	79	102	343	337	841	943	1,084	1,028	571	304	131	111	5,874

TABLE VII.—*Number of days on which auroras were reported,* 1901.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Alabama	0	0	0	0	0	0	0	0	0	0	0	0	0
Arizona	0	0	0	0	0	0	0	0	0	0	0	0	0
Arkansas	0	0	0	0	0	0	0	0	0	0	0	0	0
California	0	1	0	0	0	0	0	0	0	0	0	0	1
Colorado	2	0	0	0	1	0	0	0	0	0	2	0	5
Connecticut	1	0	0	0	0	0	0	0	0	0	0	0	1
Delaware	0	0	0	0	0	0	0	0	0	0	0	0	0
Dist. of Columbia	0	0	0	0	0	0	0	0	0	0	0	0	0
Florida	0	0	0	0	0	0	0	0	0	0	0	0	0
Georgia	0	0	0	0	0	0	0	0	0	0	0	0	0
Idaho	1	0	0	0	0	0	1	0	1	0	0	0	3
Illinois	1	0	0	5	3	0	3	1	1	0	0	0	14
Indiana	0	0	0	0	0	0	0	0	0	0	0	2	2
Indian Territory	0	0	0	0	0	0	0	0	0	0	0	0	0
Iowa	0	1	0	0	0	1	0	0	0	0	0	0	2
Kansas	0	0	0	0	0	0	0	0	0	0	2	0	2
Kentucky	1	0	0	0	0	0	0	0	0	0	0	0	1
Louisiana	0	0	0	0	0	0	0	0	0	0	0	0	0
Maine	2	0	0	2	0	0	1	0	0	1	0	0	6
Maryland	4	0	2	0	0	0	0	5	0	0	0	0	11
Massachusetts	0	0	0	0	0	0	0	0	0	0	0	0	0
Michigan	0	0	1	1	0	1	3	0	0	0	1	0	7
Minnesota	2	0	0	0	0	0	1	0	0	0	3	0	6
Mississippi	0	0	0	0	0	0	0	0	0	0	0	0	0
Missouri	2	0	0	0	0	0	2	1	0	3	1	0	9
Montana	0	0	1	0	0	1	1	1	0	0	3	0	7
Nebraska	0	0	0	5	2	3	0	0	0	1	4	1	16
Nevada	0	0	0	0	0	0	0	0	0	0	0	0	0
New Hampshire	1	0	0	0	0	0	1	0	2	1	1	0	6
New Jersey	1	0	2	0	0	2	0	0	0	0	0	0	5
New Mexico	0	0	0	0	0	0	0	0	0	0	0	0	0
New York	2	2	0	2	0	0	0	2	1	0	0	0	9
North Carolina	0	1	2	0	0	0	0	0	0	0	0	1	4
North Dakota	5	1	1	1	1	0	2	2	1	1	3	0	18
Ohio	0	3	0	0	0	1	7	4	1	2	0	0	18
Oklahoma	0	3	0	0	0	0	0	0	0	0	0	0	3
Oregon	0	0	0	0	0	0	0	2	0	0	0	0	2
Pennsylvania	0	1	0	1	0	0	0	0	0	0	0	0	2

TABLE VII.—*Number of days on which auroras were reported*, 1901.—Cont.

State and station.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Rhode Island	0	0	0	0	0	0	0	0	0	0	0	0	0
South Carolina	0	0	0	0	0	0	0	0	0	0	0	0	0
South Dakota	0	5	2	4	0	0	0	0	1	2	1	15	
Tennessee	0	0	0	0	0	0	0	0	0	0	0	0	0
Texas	0	0	0	0	0	0	0	0	0	0	0	0	0
Utah	0	0	2	0	0	0	0	0	0	0	0	0	2
Vermont	0	0	0	1	0	0	0	0	0	0	0	0	1
Virginia	0	0	0	0	0	0	0	0	0	0	0	0	0
Washington	0	0	0	0	0	0	0	0	0	1	0	0	1
West Virginia	0	0	0	0	1	0	0	0	0	0	0	0	1
Wisconsin	0	2	0	0	0	0	0	0	1	0	0	1	4
Wyoming	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	25	20	13	22	8	8	23	18	8	12	22	6	185

TABLE VIII.—*Heights of rivers above zeros of gages*, 1901.

Stations.	Highest water.		Lowest water.		Mean stage.	Annual range.
	Stage.	Date.	Stage.	Date.		
Mississippi River.	*Feet.*		*Feet.*		*Feet.*	*Feet.*
St. Paul, Minn[2]	7.5	Apr. 12	1.3	Nov. 25, 29	4.2	6.2
Reads Landing, Minn	7.1	Apr. 11–14	−0.9	Feb. 27, 28	2.2	8.0
La Crosse, Wis	8.9	Apr. 14, 15, 17	0.3	Dec. 15	4.2	8.6
Prairie du Chien, Wis.[2]	11.0	Apr. 18–20	1.5	Dec. 3–6	4.6	9.5
Dubuque, Iowa[2]	11.0	Apr. 20	1.8	Dec. 8, 9	5.0	9.2
Leclaire, Iowa[2]	7.0	Apr. 21–24	0.5	Dec. 12	3.0	6.5
Davenport, Iowa[1]	9.4	Mar. 17	1.5	Dec. 10	4.3	7.9
Muscatine, Iowa	11.1	Mar. 22, 23	1.9	Dec. 19, 20	4.9	9.2
Galland, Iowa	6.4	Mar. 24–26	0.6	{Sept. 10–12. / Dec. 8–13, 16}	2.1	5.8
Keokuk, Iowa	11.3	Mar. 25	−1.5	Dec. 16	3.4	12.8
Hannibal, Mo	12.9	Apr. 8	−0.6	Feb. 7	4.0	13.5
Grafton, Ill	16.6	Apr. 10, 11	1.4	Dec. 17, 18	6.0	15.2
St. Louis, Mo	22.4	Apr. 18, 19	−1.3	Dec. 19	7.9	23.7
Chester, Ill	19.7	Apr. 19	−0.3	Dec. 21	6.0	20.0
New Madrid, Mo[2]	34.2	May 2, 3	3.3	Nov. 28–30	15.2	30.9
Memphis, Tenn	32.1	May 6, 7	−0.2	Nov. 29–Dec. 2	11.3	32.3
Helena, Ark	41.6	May 9	1.4	Dec. 2	17.0	40.2
Arkansas City, Ark	43.3	May 12, 13	1.0	Nov. 29–Dec. 4	18.0	42.3
Greenville, Miss	37.4	May 13	0.8	Dec. 4	15.0	36.6
Vicksburg, Miss	41.5	May 15, 16	−2.3	Dec. 5–7	16.1	43.8
New Orleans, La	14.2	May 14	2.8	Nov. 22, 23, 28	6.7	11.4
Missouri River.						
Bismarck, N. Dak	10.2	June 5	−0.5	Nov. 10	3.4	10.7
Pierre, S. Dak.[4]	9.8	June 18	0.7	Dec. 8	4.4	9.1
Sioux City, Iowa[4]	13.5	June 21	4.7	Nov. 28–Dec. 1	6.5	8.8
Omaha, Nebr[1]	13.8	June 23	3.0	Jan. 1	7.6	10.8
St. Joseph, Mo.	9.6	June 24	−3.1	Jan. 2	2.6	12.7
Kansas City, Mo	19.4	June 24, 25	3.7	Jan. 11; Dec. 18	9.2	15.7
Boonville, Mo	15.8	June 26	1.3	Feb. 10, 11	7.4	14.5
Hermann, Mo	15.5	Apr. 17, 18	0.8	Dec. 18	6.5	14.7
Illinois River.						
Peoria, Ill	17.7	Mar. 31	5.5	July 26–28	8.2	12.2
Youghiogheny River.						
Confluence, Pa	10.6	Dec. 15	0.0	Nov. 2–12	2.0	10.6
West Newton, Pa[1]	12.0	Apr. 21	0.0	Oct. 25–Nov. 12	2.1	12.0
Allegheny River.						
Warren, Pa	10.9	Dec. 15	0.0	Nov. 7–11	2.4	10.9
Oil City, Pa	11.5	Mar. 27	0.3	Nov. 11, 12	3.0	11.2
Parker, Pa	13.4	Dec. 15	−0.2	Nov. 10, 11	3.2	13.6
Monongahela River.						
Weston, W. Va	12.9	Dec. 15	−0.6	Aug. 5–10	0.5	13.5
Fairmont, W. Va	18.5	Dec. 15	0.0	Oct. 21–Nov. 12	2.5	18.5
Greensboro, Pa	24.0	Dec. 15	6.0	Oct. 30–Nov. 14	8.4	18.0
Lock No. 4, Pa	28.5	Dec. 16	4.1	Aug. 11	9.0	24.4
Conemaugh River.						
Johnstown, Pa	10.8	Dec. 15	0.4	Nov. 6–12	2.3	10.4
Red Bank Creek.						
Brookville, Pa	5.7	Apr. 20	−0.5	July 15–Aug. 15	1.0	6.2
Beaver River.						
Ellwood Junction, Pa[3]	13.0	Mar. 10	1.3	Aug. 14, 15	3.6	11.7
Great Kanawha River.						
Charleston, W. Va	38.5	{May 23. / Dec. 30}	3.6	Feb 26, 27	8.2	34.9
Little Kanawha River.						
Glenville, W. Va	24.3	Apr. 4	−2.5	Oct. 31–Nov. 4	1.4	26.8
New River.						
Hinton, W. Va	18.0	{Apr. 21, / May 23}	1.6	Feb. 25	3.6	16.4
Cheat River.						
Rowlesburg, W. Va.[1]	12.6	Dec. 15	−1.4	Nov. 10–12	3.0	14.0
Ohio River.						
Pittsburg, Pa	27.4	Apr. 21	0.6	July 15	6.7	26.8
Davis Island Dam, Pa	25.8	Apr. 21	1.8	Nov. 6–8	6.7	24.0
Wheeling, W. Va	41.3	Apr. 22	1.5	Nov 4, 8–12	8.8	39.8
Parkersburg, W. Va	43.9	Apr. 23	1.9	Nov. 9–12	9.7	42.0
Point Pleasant, W. Va	53.0	Apr. 24	1.9	Nov. 5–17	12.0	51.1
Huntington, W. Va	57.4	Apr. 25	3.8	Nov. 16	15.6	53.6
Catlettsburg, Ky	59.1	Apr. 25	1.9	Nov. 10, 11	15.2	57.2
Portsmouth, Ohio	58.4	Apr 26	3.1	Nov. 11, 12, 15–18	16.1	55.3
Cincinnati, Ohio	59.7	Apr. 27	4.2	{Nov. 11–13, 15, / 18–20}	17.6	55.5
Madison, Ind	49.9	Apr. 28	3.8	Nov. 20, 21	15.4	46.1
Louisville, Ky	38.2	Apr. 28, 29	2.8	Nov. 15–22	7.9	30.4

Heights of rivers above zeros of gages, 1901—Continued.

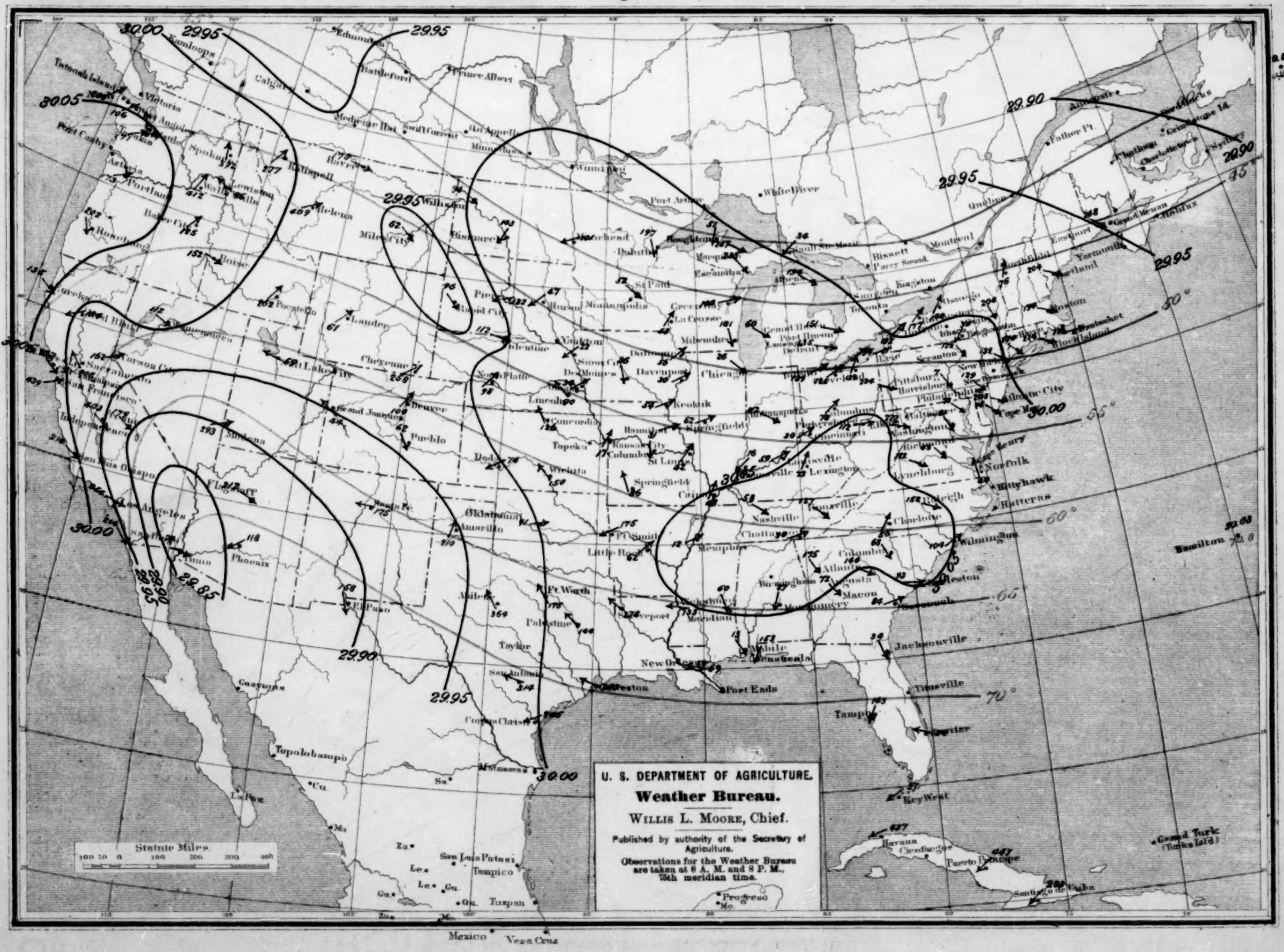
Stations.	Highest water.		Lowest water.		Mean stage.	Annual range.
	Stage.	Date.	Stage.	Date.		
Ohio River—Cont'd.	*Feet.*		*Feet.*		*Feet.*	*Feet.*
Evansville, Ind	41.8	{Apr. 30. / May 1}	1.7	Nov. 19–25	13.3	40.1
Paducah, Ky	39.4	May 1	1.5	Nov. 18–21, 26–28	13.7	37.9
Cairo, Ill	43.2	May 2	2.9	Nov. 21, 22, 27–29	17.9	40.3
Muskingum River.						
Zanesville, Ohio	24.3	Apr. 27	5.8	{July 31–Aug. 2 / Oct. 22, 23, 29.}	8.2	18.5
Scioto River.						
Columbus, Ohio	9.5	Mar. 11	1.8	Aug. 11–13	2.2	7.7
Miami River.						
Dayton, Ohio	7.0	Mar. 11	0.1	Nov 24, Dec. 12.	1.3	6.9
Wabash River.						
Mt. Carmel, Ill.	17.5	Mar. 19	0.0	Oct. 5–12	3.8	17.5
Licking River.						
Falmouth, Ky	20.2	Apr. 20	0.2	Oct. 26–Nov. 11.	2.8	20.0
Kentucky River.						
Frankfort, Ky[4]	25.1	Apr. 23	4.9	Nov. 1, 2	5.5	20.2
Clinch River.						
Speer's Ferry, Va	21.5	Dec. 30	−0.7	Nov. 22	1.6	22.2
Clinton, Tenn	31.0	Dec. 31	2.2	Dec. 2	7.1	28.8
Tennessee River.						
Knoxville, Tenn	34.8	May 23	0.8	Nov. 21, 22	4.6	34.0
Kingston, Tenn	28.8	Dec. 31	1.4	Nov. 8–11, 22, 23.	5.0	27.4
Chattanooga, Tenn	39.5	Dec. 31	2.1	Oct. 22	8.2	37.4
Bridgeport, Ala	24.5	Aug. 18	0.8	Nov. 23	6.0	23.7
Florence, Ala	19.0	Aug. 22	0.9	{Aug. 5 / Nov. 22–25}	6.0	18.1
Riverton, Ala	29.7	Aug. 23	−0.1	Nov. 24, 28	8.2	29.8
Johnsonville, Tenn	27.6	Aug. 26	1.6	Nov. 27–30	9.4	26.0
Cumberland River.						
Burnside, Ky	52.0	Apr. 20	0.3	Aug. 11	6.5	51.7
Carthage, Tenn	39.9	Aug. 19	0.5	Aug. 3	7.3	39.4
Nashville, Tenn	39.8	Aug 21	1.3	Aug. 4, 5	9.8	38.5
Clarksville, Tenn	43.9	Aug. 24	1.0	Aug. 6	12.0	42.9
Arkansas River.						
Wichita, Kans	6.0	Apr. 13	0.6	Sept. 6–8	1.8	5.4
Webbers Falls, Ind. T	12.5	Apr. 18	1.5	Various dates	2.8	11.0
Fort Smith, Ark	14.7	Apr. 19	0.3	Oct. 30–Nov. 2	3.3	14.4
Dardanelle, Ark	16.0	Apr. 19	0.1	Oct. 4–7	3.1	15.9
Little Rock, Ark	17.9	Apr. 20	1.1	July 27	4.7	16.8
White River.						
Newport, Ark	23.5	Mar. 15	−0.3	Oct. 2 11	3.7	23.8
Yazoo River.						
Yazoo City, Miss	18.3	Jan. 11	−1.8	Nov. 16–18	7.8	20.1
Red River.						
Arthur City, Tex	25.6	May 20	2.8	Dec. 31	5.5	22.8
Fulton, Ark	27.7	May 25	2.6	Nov. 1–3	8.0	25.1
Shreveport, La	16.4	June 7	−1.0	Nov. 6–9, 19–21	5.0	17.4
Alexandria, La	14.6	Apr. 27	−3.4	Nov. 23, 24	4.5	18.0
Ouachita River.						
Camden, Ark	33.8	Apr. 23	3.0	Aug. 26–Sept 9	8.9	30.0
Monroe, La	24.6	May 7–9	0.0	July 13–21, 24–30.	9.4	24.6
Atchafalaya River.						
Melville, La	31.4	May 16–19	2.8	Nov. 22	17.1	28.6
Susquehanna River.						
Wilkesbarre, Pa	24.0	Dec. 15	−1.4	July 23–25	5.9	25.4
Harrisburg, Pa	21.4	Dec. 16	1.0	Nov. 12	4.0	20.4
W. Br. of Susquehanna.						
Williamsport, Pa.	20.7	Dec. 15	0.4	Nov. 11	3.4	20.3
Juniata River.						
Huntingdon, Pa[3]	14.0	Dec. 15	3.0	Various dates	4.1	11.0
Potomac River.						
Harpers Ferry, W. Va	20.2	Apr. 22	−3.0	{Aug. 5–7, Sept. / 24–29, Oct. 6–31}	2.1	23.2
James River.						
Lynchburg, Va	21.2	Dec. 30	0.1	Nov. 22, 23	2.3	21.1
Richmond, Va	23.2	Dec. 31	−1.2	{Jan. 21–24. / July 6–8}	1.3	24.4
Roanoke River.						
Weldon, N. C	45.7	May 25	8.3	{Jan. 8–11, Mar. / 5–11, Feb. 26–28}	12.9	37.4
Cape Fear River.						
Fayetteville, N. C	58.5	May 24	3.0	Mar. 10	10.6	55.5
Edisto River.						
Edisto	6.5	May 27	1.9	Dec. 11–15	4.0	4.6
Pedee River.						
Cheraw, S. C	36.2	Aug. 8	1.4	Mar. 10	9.0	34.8
Black River.						
Kingstree, S. C	12.0	June 1	0.7	Nov. 4, 5	6.2	11.3
Lynch Creek.						
Effingham, S. C	17.2	June 22	3.3	Nov. 1, 2	7.1	13.9
Santee River.						
St. Stephens, S. C	16.0	May 31	3.7	Mar. 11	8.0	12.3
Congaree River.						
Columbia, S. C	22.0	{Apr. 4 / May 24}	−0.2	Mar. 10–11	3.5	22.2
Wateree River.						
Camden, S. C	32.5	May 24	3.1	Mar. 9, 10	11.1	29.4
Waccamaw River.						
Conway, S. C	8.7	July 29, 30	1.0	Nov. 25	4.7	7.7
Savannah River.						
Calhoun Falls, S. C	17.9	Dec. 30	2.1	Dec. 1, 2	4.0	15.8
Augusta, Ga	31.8	Apr. 4	7.0	Aug. 4	11.9	24.8
Broad River.						
Carlton, Ga	19.9	Dec. 30	2.3	Aug. 2–5	3.6	17.6
Flint River.						
Albany, Ga	25.2	Sept. 22	0.7	Nov. 22	7.2	24.5
Chattahoochee River.						
Westpoint, Ga	25.0	Dec. 30	2.4	Nov. 18, Dec. 2	5.0	22.6
Ocmulgee River.						
Macon, Ga	18.8	Apr. 3	1.7	Oct. 30–Nov. 4	5.4	17.1

Heights of rivers above zeros of gages, 1901—Continued.

Stations.	Highest water.		Lowest water.		Mean stage.	Annual range.
	Stage.	Date.	Stage.	Date.		
Oconee River.						
Dublin, Ga.	22.6	Apr. 6	0.5	Aug. 6	5.5	22.1
Coosa River.						
Rome, Ga.	32.6	Dec. 31	1.0	Nov. 11-20	5.5	31.6
Gadsden, Ala.	22.4	Jan. 13	0.1	Nov. 29-Dec. 3	6.1	22.3
Alabama River.						
Montgomery, Ala.	44.4	Dec. 31	1.2	Nov. 11, 12	9.8	43.2
Selma, Ala.	40.0	Jan. 17	1.0	July 1	11.8	39.0
Tombigbee River.						
Columbus, Miss.	22.7	Jan. 15	−3.5	Aug. 3	2.2	26.2
Demopolis, Ala.	49.6	Jan. 21	−2.3	Aug. 5, 6	12.0	51.9
Black Warrior River.						
Tuscaloosa, Ala.	56.5	Jan. 13	0.2	Aug. 10, 11	11.0	56.3
Brazos River.						
Kopperl, Tex.	6.5	June 3	−1.6	Dec. 13-31	0.0	8.1
Waco, Tex.	10.2	June 3	0.4	Aug. 1	1.6	9.8
Brazos River—Cont'd.						
Booth, Tex.[2]	13.0	May 27	−0.4	May 17	1.4	13.4
Red River, North.						
Moorhead, Minn.[3]	9.1	July 9	6.8	Nov. 6	7.9	2.3
Columbia River.						
Umatilla, Oreg.	22.1	May 31	−3.4	Nov. 30	6.8	25.5
The Dalles, Oreg.	37.5	June 1	1.8	{Oct. 26, 28, 29, 31. {Nov. 2	11.8	35.7
Willamette River.						
Albany, Oreg.	30.4	Jan. 15	0.8	Aug. 10-Sept. 9.	4.7	29.6
Portland, Oreg.	20.8	{Jan. 17 {June 3	0.4	Oct. 21, 22	8.1	20.4
Sacramento River.						
Red Bluff, Cal.	20.1	Feb. 20	−0.4	Sept. 14-18	3.2	20.5
Sacramento, Cal.	28.2	Feb. 25	7.2	Sept. 21, 22	15.3	21.0

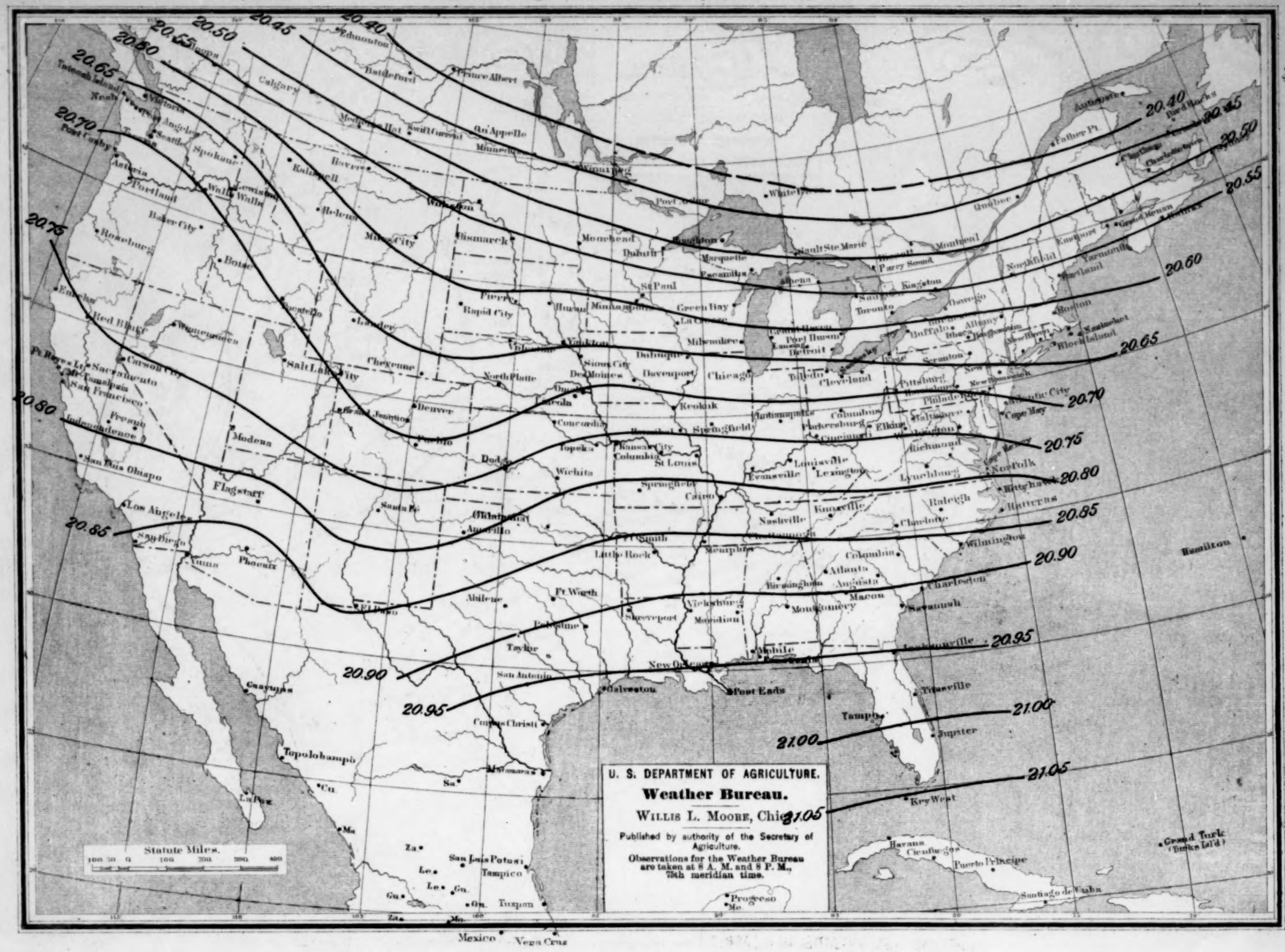
[1] 11 months. [2] 8 months. [3] 10 months. [4] 9 months. [5] 6 months.

• Barkerville **Chart I. Sea-Level Pressure and Temperature; Resultant Surface Winds, 1901.**


30.00
29.95
29.90
29.85
Edmonton
Kamloops
Battleford
Prince Albert
Calgary
Victoria
Medicine Hat
Swift Current
Moose Jaw
Winnipeg
White River
Port Arthur
Duluth
Minneapolis
St Paul
La Crosse
Milwaukee
Chicago
Detroit
Toronto
Ottawa
Montreal
Quebec
Father Pt.
Halifax
Yarmouth
Eastport
Portland
Boston
Block Island
Albany
Buffalo
Scranton
Pittsburg
Harrisburg
Philadelphia
Atlantic City
New York
Cleveland
Columbus
Indianapolis
Springfield
Peoria
Keokuk
Davenport
Des Moines
Omaha
Lincoln
Concordia
Topeka
Kansas City
Columbia
St Louis
Louisville
Lexington
Cincinnati
Nashville
Chattanooga
Memphis
Little Rock
Fort Smith
Springfield
Wichita
Dodge City
Oklahoma
Amarillo
Abilene
Fort Worth
Palestine
Taylor
San Antonio
Galveston
Port Eads
New Orleans
Mobile
Montgomery
Macon
Atlanta
Birmingham
Augusta
Charleston
Wilmington
Hatteras
Norfolk
Lynchburg
Roanoke
Knoxville
Jacksonville
Tampa
Key West
Havana
Cienfuegos
Puerto Principe
Santiago de Cuba
Grand Turk (Turks Isl'd)
Hamilton
Bermuda
St Johns
Eureka
Red Bluff
San Francisco
Carson City
Salt Lake City
Winnemucca
Ely
Reno
Independence
Los Angeles
San Diego
Yuma
Phoenix
Flagstaff
Prescott
Tucson
El Paso
Roswell
Santa Fe
Albuquerque
Pueblo
Denver
Grand Junction
Helena
Miles City
Havre
Williston
Bismarck
Huron
Yankton
Sioux City
Rapid City
Bismarck
Minot
Winnipeg
Duluth
Marquette
Escanaba
Alpena
Grand Haven
Port Huron
Detroit
Erie
Rochester
Oswego
Albany
Burlington
Portland
Eastport
Yarmouth
Halifax
Quebec
Father Pt.
Anticosti
Sydney
Charlottetown
Pictou
Grindstone I.
Bermuda
St Johns
Hamilton
Grand Turk (Turks Isl'd)
Santiago de Cuba
Puerto Principe
Havana
Cienfuegos
Key West
Tampa
Jacksonville
Charleston
Wilmington
Hatteras
Norfolk
Block Island
Boston

• Barkerville

Chart II. High-Level Pressure (10,000 feet), 1901.



• Barkerville

Chart III. Surface Temperatures, 1901.

Chart III. Surface Temperatures. 1901.

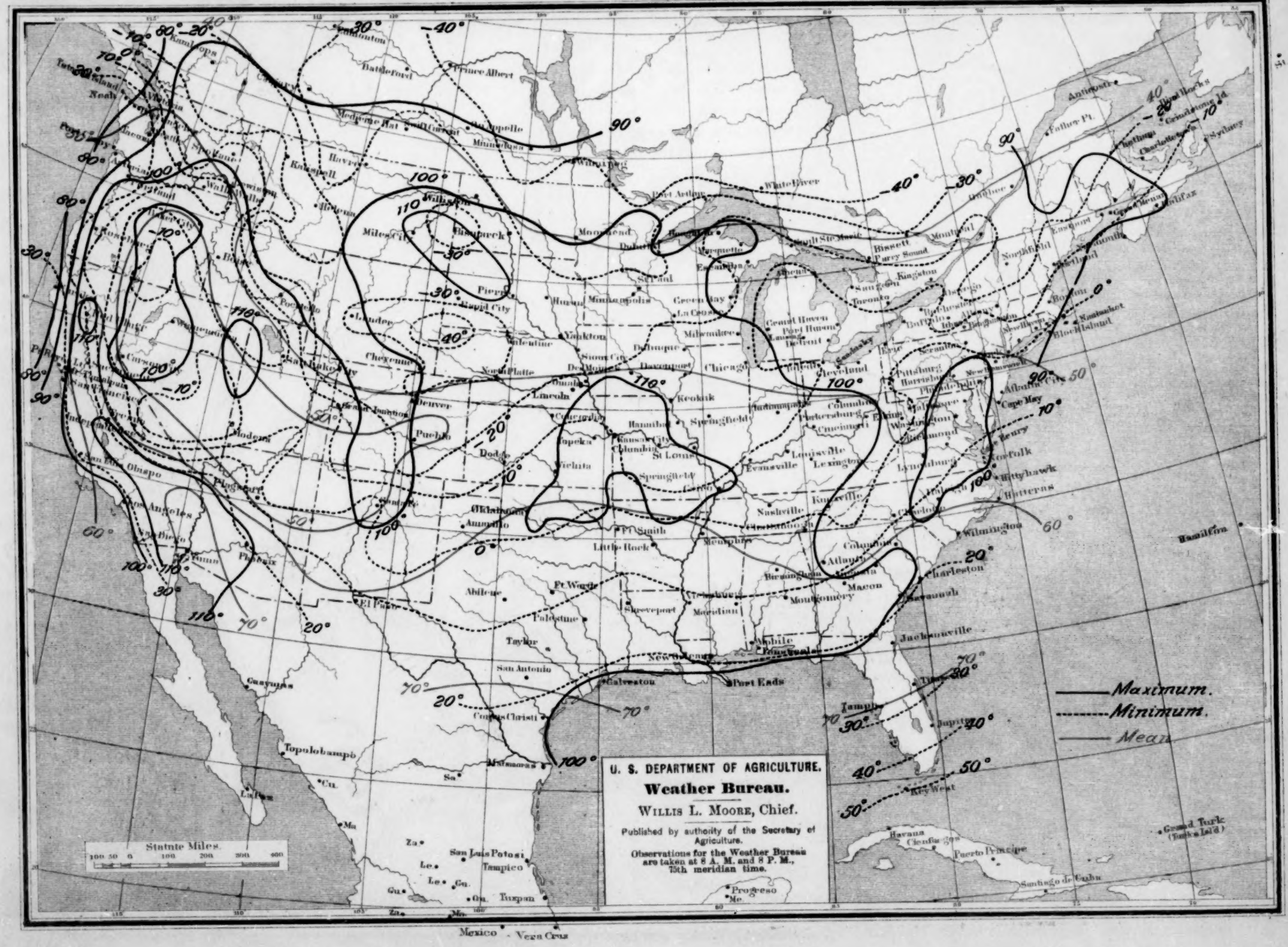
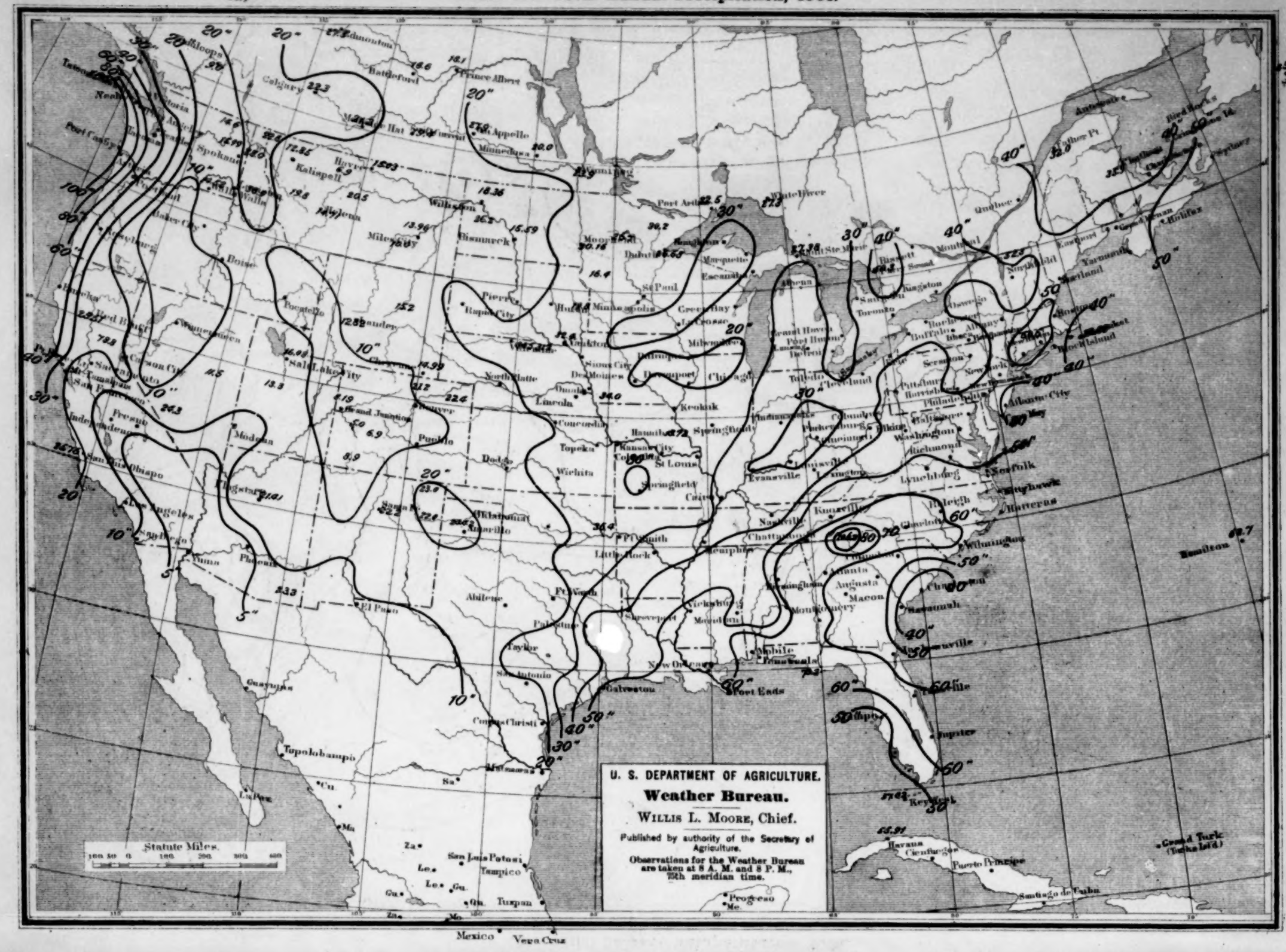


Chart IV. Total Annual Precipitation, 1901.



Washington, D. C., 1901.

Chart V. Total Number of Thunderstorm Days, 1901.

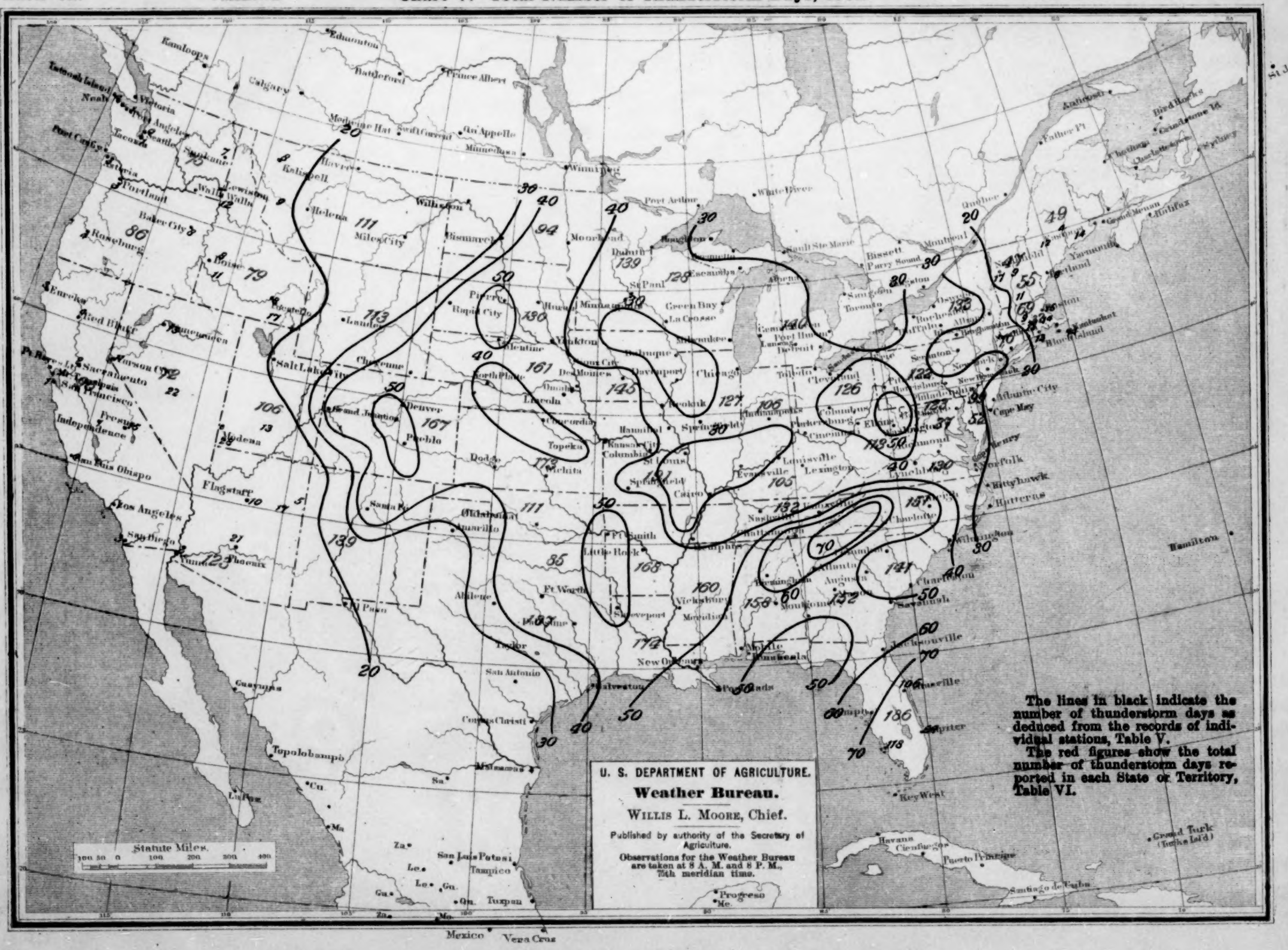

Statute Miles.
100 50 0 100 200 300 400
U. S. DEPARTMENT OF AGRICULTURE.
Weather Bureau.
WILLIS L. MOORE, Chief.
Published by authority of the Secretary of Agriculture.
Observations for the Weather Bureau are taken at 8 A. M. and 8 P. M., 75th meridian time.
The lines in black indicate the number of thunderstorm days as deduced from the records of individual stations, Table V.
The red figures show the total number of thunderstorm days reported in each State or Territory, Table VI.

Chart VI. Percentage of Sunshine, 1901.

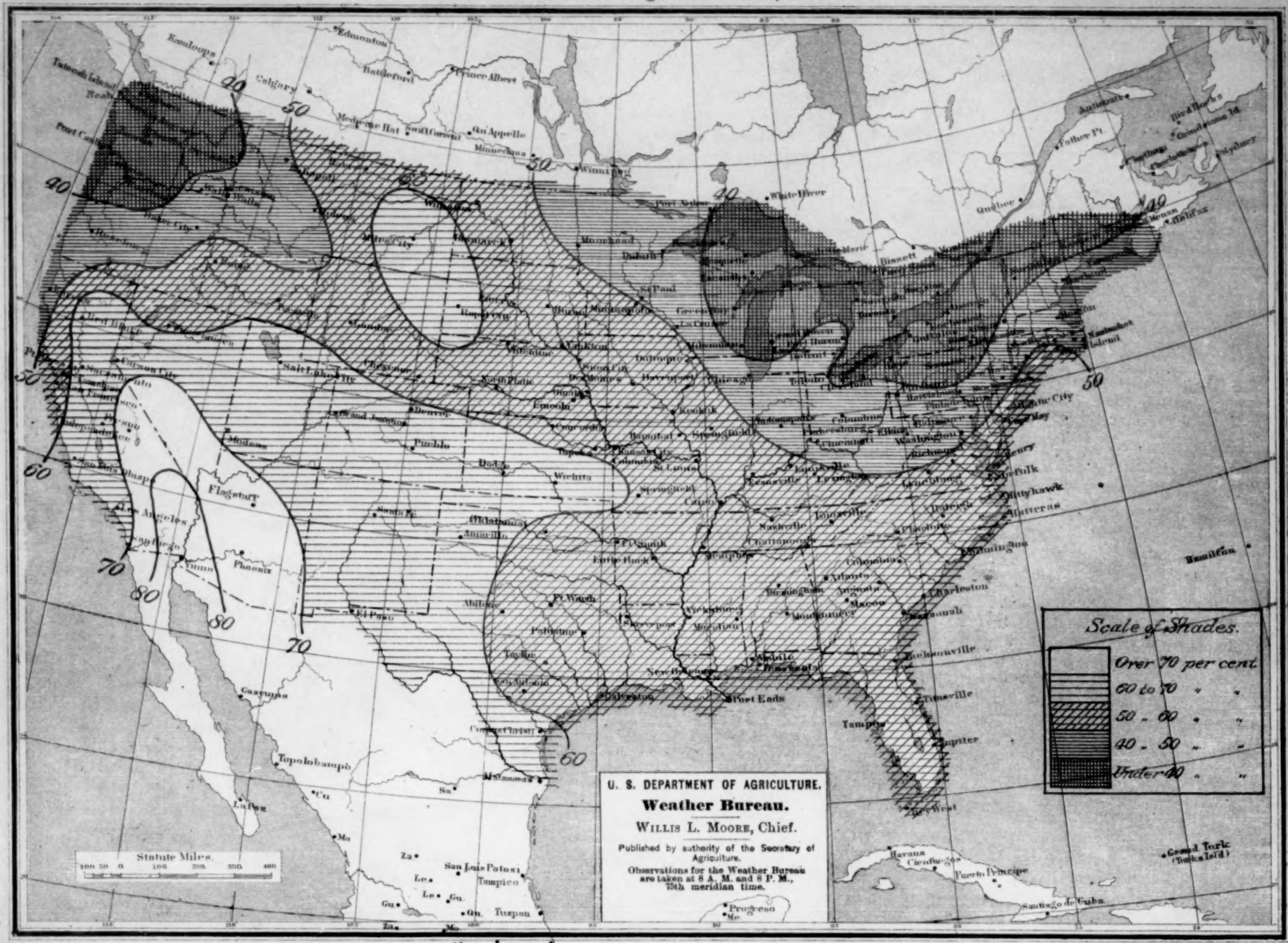
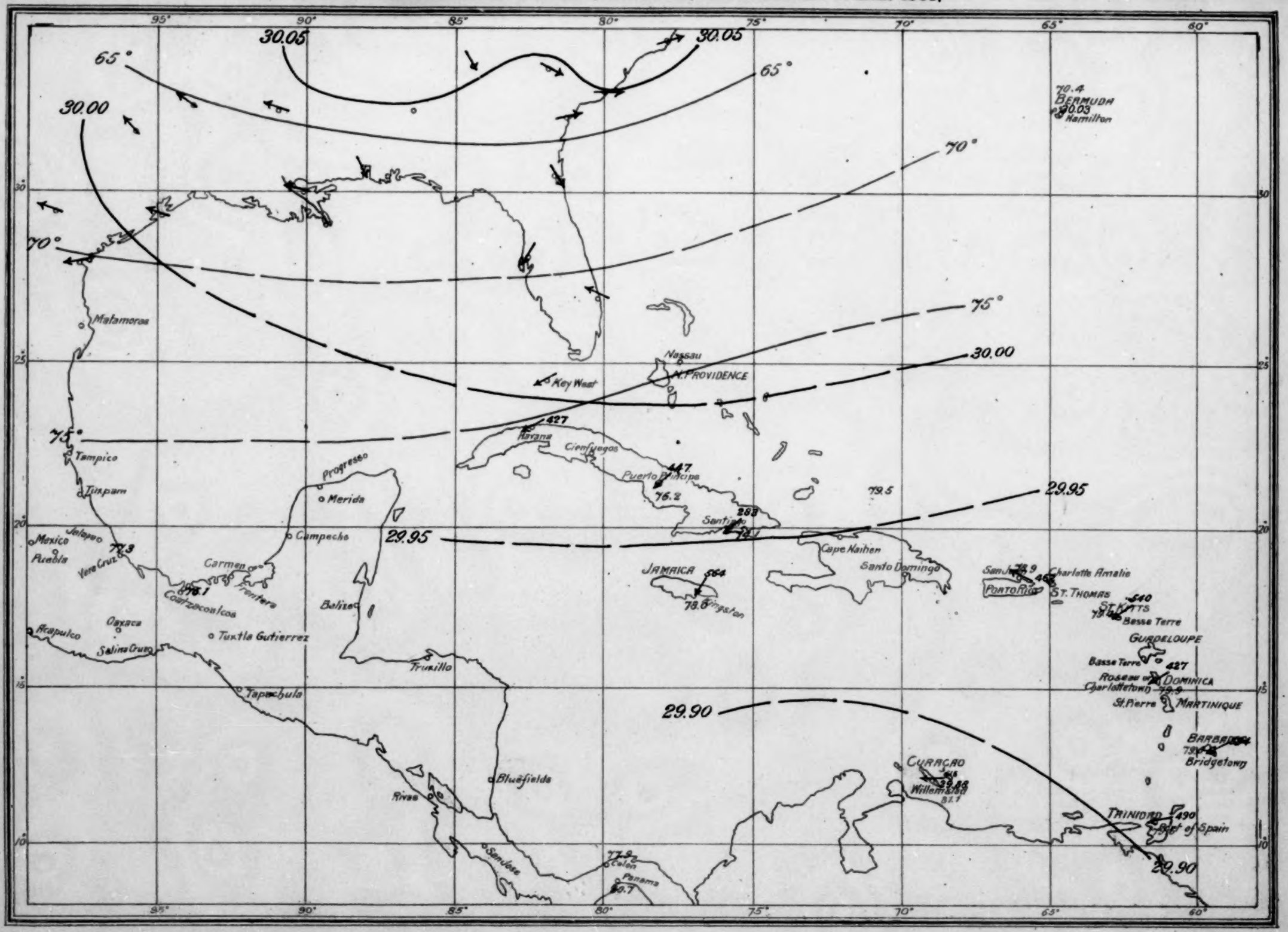


Chart VII. West Indian Isobars, Isotherms, and Resultant Winds, 1901.

Chart VII. West Indian Isobars, Isotherms, and Resultant Winds. 1901.



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CONTENTS:

	Page.		Page.
TITLE PAGE, CONTENTS, AND INDEX TO VOL. XXIX..	I-IX	SPECIAL CONTRIBUTIONS.....	594
INTRODUCTION.....	591	CLIMATOLOGICAL TABLES.....	606
FORECAST DIVISION.....	591		
GENERAL CLIMATIC CONDITIONS.....	592	CHARTS.....	I to VII

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